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Intrinsic and extrinsic variables affecting referential communication performance in young children.

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INTRINSIC AND EXTRINSIC VARIABLES AFFECTING REFERENTIAL COMMUNICATION PERFORMANCE IN YOUNG CHILDREN

by

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ABSTRACT

The present study examined variables affecting referential communication in young children. Referential communication refers to speech which is produced in order to provide information about a set of referent figures. Within the present design, type of referent figure, type of listener feedback and sex of the speaker were varied for preschool and grade one children. In addition, estimates were obtained and used to determine their relative effect on referential communication performance.

The results are consistant with the previous literature in that the grade one children obtained higher referential communication scores than did the preschool children. However, it was found that type of referent stimulus and type of feedback provided by the listener had a significant effect on referential communication performance. Higher scores were obtained by both grade levels when less abstract figures and more specific feedback were used.

When referential communication scores were statistically equated for visual discrimination ability, the significant difference was eliminated between the two age levels. This indicates that visual discrimination may be a primary component in referential communication performance. No significant changes were observed in a similar analysis based on vocabulary level.

The results are discussed in relation to a production deficiency hypothesis. The argument is presented that given adequate feedback and age-appropriate materials, children below the age of six years are capable of referential communication performance. Secondly, it is possible to differentiate between referential communication performance in a preschool population, contrary to previously reported results, using the referent materials developed for this study.

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INTRODUCTION

Human communication can be considered as a situation in which one person constructs and transmits a message containing information in a form which allows a second person to interpret and respond to the information when it is received (Krauss and Weinheimer, 1967; Chaplin, 1968). In the situation described above, the person who transmits the message is referred to as the speaker and the person who receives the message is referred to as the listener. One aspect of human communication which has been investigated is referential communication (Glucksberg, Krauss and Weisberg, 1966; Krauss and Glucksberg, 1969; 1970) which involves the use of specific reference materials or referents. The speaker is asked to verbally communicate information about each referent stimulus to a listener. The listener is then required to choose the particular referent which has been described from a display of six possible referent stimuli. A measure of the speaker's communicative performance, described by McNeill (1966) as the ability to produce an appropriate linguistic response in a given task situation, is based on the number of correct choices made by the listener. A low score indicates poor communicative performance and a high score indicates that the speaker did provide the listener with adequate information about each of the referent stimuli. Previous

referential communication studies based on children's communicative performance (Glucksberg et al, 1966; Glucksberg and Krauss, 1967; Krauss et al, 1969, 1970) have demonstrated that preschool children in particular find referential verbal communication tasks to be very difficult. The purpose of the present study is to determine if preschool children are simply unable to perform successfully on referential verbal communication tasks or whether certain aspects of the task itself influence the production of the inadequate messages usually provided by preschool children.

Referential verbal communication research has been primarily based on a set of referent stimuli developed by Krauss and Weinheimer (1964) for referential communication research involving adults. While the administration of the referential task was adapted for use with children (Glucksberg et al, 1966), the same referent stimuli were retained. These stimuli are abstract, complex figures which were deliberately developed for their lack of readily encodable features based on criteria developed by Brown and Lenneberg (1954). Within the referential task paradigm (see Appendix A) and using the materials described above, the following variables have been manipulated to determine their effect on task performance: varying the ages of the speaker and/or the listener (Krauss et al, 1966; Krauss et al, 1969); allowing the listener to provide specific

types of responses in reply to the speaker's initial message (Krauss et al, 1966; 1970); varying status, (based on race, socio-economic levels, etc.) of the speaker and/or listener (Krauss and Rotter, 1968). On the basis of the research, the following conclusions are possible: (i) Communicative performance on referential tasks improves with age. Children below the age of four years appear to be unable to either understand or perform the task, while children between the ages of four and six years appear to understand what is required but are unable to perform successfully. Between the ages of six and seven years, some children achieve limited success on the referential task and the level of success continues to increase with age until maximum communicative performance is achieved in early adulthood. (ii) Responses provided by the listener to the speaker do not appear to increase the amount of information included in subsequent messages by preschool and first grade children. (iii) the lower socio-economic status children were less able to perform effectively as either the speaker or listener.

Early referential communication studies, such as those discussed above, were consistant in demonstrating that preschool children found such tasks to be very difficult. As a result, Flavell, Botkin, Fry, Wright and Jarvis (1968), posited three possible hypotheses to account for such difficulties in preschool children: (i) the

speaker is unaware of what the listener requires to perform the task; (ii) the speaker may realize that the listener requires some information but not which information is needed; (iii) the speaker may understand exactly what the listener requires but not be able to express it. Each hypothesis focused upon the requirements which must be fulfilled by the speaker in order to provide the necessary information to the listener. Of the three alternatives, the first hypothesis has been the most widely accepted. This has led to interpretations of young children's behaviour on such tasks in terms of the cognitive-developmental theory of Piaget (1926, 1956, 1969).

Such interpretations have been based primarily on Piaget's concept of egocentrism. Egocentrism refers to an inability to realize that perspectives other than one's own do exist and must be considered in certain situations (Looft, 1972). In a referential communication task, the speaker would have to realize that the listener does not know the correct referent choice and requires a detailed, comprehensive description of the referent to make the correct choice. If adequate detail is not provided or if the description is not understood by the listener. Since it has been demonstrated (Glucksberg et al, 1966; Gruschcow and Gauthier, 1971) that preschool listener's can make the correct choice when provided with an adequate description

of the referent, it would seem to imply that the reason for the performance difficulty is related to the communication provided by the preschool aged speaker.

Flavell et al (1968), Krauss et al. (1970), Elkind (1974) and others have described the referent descriptions of preschool children as being essentially egocentric. Such descriptions are based on information which is known only to the speaker and therefore contains little meaning for the listener. Since the listener does not understand the description, it does not provide an adequate basis for making an accurate decision. As children grow older, their descriptions become less egocentric and more social as the speaker based his descriptions on information which is more common and well-known and therefore more meaningful to the listener. As a consequence of the increase in clarity and referential information, communicative performance levels increase. Krauss et al (1970) have argued that the increase in successful performance can be explained by the decrease in egocentrism which occurs with increased age (Looft, 1972; Elkind, 1974). Such a position allows the argument to be made that the increase in social or shared referential communication is due to an increased awareness of the prespective of the listener. This results in adjustments being made by the speaker to compensate for the limited information about the referent which is available to the listener.

While the research to date generally supports the position just discussed, there are enough inconsistancies to suggest that such an interpretation is not entirely adequate to explain all the available evidence. In particular, the evidence related to three factors which could affect the referential task performance of preschool children seems inconclusive. The three factors in question are the amount of egocentric speech normally found at different age levels, the effects of different types of referent stimuli and the effects of varying the amount of information in the response provided by the listener after the speaker's initial message. Since one purpose of the present study is to evaluate the effect of specific aspects of the task on communicative performance, each of the above factors will be considered and its implications for the present study discussed.

The amount of egocentric speech relative to the amount of social speech used by children at different age levels was first reported by Piaget (1926). He found the speech of five year old children to be forty to seventy percent egocentric. This led Piaget (1926) to conclude that children below this age produced almost totally egocentric speech while children above this age used increasing percentages of social speech. Since the use of social speech includes an awareness of the listener's perspective, it is clear that a high level of egocentric speech would severely

limit a child's ability to produce referential messages which were meaningful to the listener. However, evidence which conflicts with Piaget (1926) has been reported by Vygotsky (1962), Kohlberg, Yaeger and Hjestholm (1968), Borke (1971; 1972), Garvey and Hogan (1973) and others who have found much higher levels of social speech being spontaneously produced by preschool children. This would seem to imply that preschool children possess the basic communicative skills necessary to perform successfully on referential verbal communication tasks. Maratsos (1973), using a simplified referential communication task, found that not only did children as young as three years of age spontaneously produce social speech, but that the same children were able to adjust their messages to compensate for varying listener characteristics (e.g. being able to see or not able to see). Such results raise the question of why preschool children find the Glucksberg et al (1966) paradigm so difficult. Since the demands of the speaker in any referential verbal communication task are essentially to construct a message containing sufficient information about the referent stimulus and transmit this message to a listener, preschool children should be able to perform the tasks used by both Glucksberg et al (1966) and Maratsos (1973). Since, based on the literature, they are not able to perform both tasks, it seems reasonable to assume that the referential task which was used must have exerted an

influence on the preschool child's communicative performance.

While preschool children were capable of performing the task during the simplified training and pretest trials (Glucksberg et al, 1966; Krauss et al, 1969), they displayed considerable difficulty when the Krauss et al (1964) figures described earlier were introduced. Therefore, it is possible that the preschool children's failure may be due either to the child's egocentric development as has been argued or to a limited repetoire of possible referent descriptions which are available to the child. Support for the latter viewpoint can be found in the study by Krauss et al (1970) who reported that the egocentric referential messages produced by each child to describe the Krauss et al (1964) abstract figures contained sufficient information to enable each child to make correct choices, as long as each child was provided with his own messages. This would seem to imply that even the preschool children were aware of the demands of the task and that their referential messages were based on salient features of the abstract figures. If this interpretation is correct, it would be possible to argue that the figures used in the Glucksberg et al (1966) paradigm were not appropriate for use with preschool children since the figures are extremely difficult to describe and may result in egocentric referential messages being produced. Consequently, it would not

be possible to decide whether preschool children could perform a referential task of this type since the task does not appear to discriminate between egocentric and nonegocentric communication in children below the age of about six years (Krauss et al, 1969; 1970). In the present study, a second set of figures will be used in an attempt to determine whether it is possible to discriminate between egocentric and nonegocentric referential performance in preschool children.

The second set of figures which was constructed for use with preschool and early primary school children attempted to eliminate the potential problem associated with the original figures which was discussed above. Each figure was constructed of six separate parts from six of the animal figures used in a referential communication study by Gruschcow and Gauthier (1971). The resulting animal figures were nonspecific (since they were composed of the parts of six separate animals) and complex (since the resulting figures had many features which could be described). The major difference between the two sets of figures is that the newly constructed animal set contains features which are more familiar and therefore should be easier to describe. For example, each figure contains a head, four legs, body, etc. Since these are familiar features to preschool children, they should provide a framework for constructing the referential message. Also,

a simple listing of such features would not be sufficient to distinguish the proper figure since each figure contains these common attributes (See Appendix B). In order to provide a meaningful referential message, the speaker had to provide information about different parts of each figure to the listener. Because this aspect of the task applies to both sets of figures, they can be considered analygous with respect to the type of referential message which must be constructed in order to identify each figure properly. Each figure can only be identified properly by describing the features which distinquish it from the other figures which are being presented. By administering both the animal and abstract figures to preschool and first grade children, it should be possible to determine whether the type of figure used as a referent stimulus influences the production of egocentric speech in preschool children. If the preschool children produce egocentric messages for the abstract figures but not for the animal figures, it will demonstrate that they are capable of producing successful referential communication but are restricted in this ability to age appropriate materials. The first grade children will provide a control which will allow a comparison to be made between the results of the present study and the results of the previous studies described earlier.

A second factor which may influence referential

communication performance is whether the listener produces a response to the speaker's initial message. The type of response which is provided by the listener has been shown to influence subsequent adult referential communication. Krauss et al (1966; 1967) found with adults that as the number of words and the amount of directional information increased, the speaker's communication performance improved. However, Krauss et al (1970) reported that no changes were made by preschool aged speakers under similar listener response conditions. They concluded that preschool aged children did not improve in communication performance due to their lack of social awareness (and high level of egocentrism). A second interpretation may be possible based on the results of two further studies. Fishbein and Osborne (1971) reported that communication performance improved in first grade children when (i) the listener's response immediately followed the speaker's initial message and when (ii) the task participants receive immediate information on each trial about their success or failure. Peterson, Danner and Flavell (1972) found that four-year-old speakers could recognize that more information was required when the listener provided a nonspecific, general response. But the children did not appear to understand what information was required unless the response included some direction or outline to guide them. In addition, both studies concluded that as the age of the speaker

increased, there was less need to provide the specific response conditions described above. Since the Krauss et al (1966) paradigm provides for an immediate response being made by the listener following each initial referential message and also information about the success or failure of each trial, the specificity of the information provided in the listener's response appears to have a critical influence on communication performance in preschool children. The responses provided by the listener in the Krauss et al (1970) study did not contain specific or directional information which the preschool aged speakers could use to direct their formulation of a more meaningful referential message. Since adults do not require such directional types of responses (Fishbein et al, 1971; Peterson et al, 1972), they were able to improve their referential communication performance levels.

In the present study, the speaker received one of two types of responses from the listener in order to determine if the amount of direction contained in the response affects the amount of information and the type of changes made in the subsequent referential message. One type of response was general and non-directional, similar to the responses used by Krauss et al (1970). The second type was more specific and directional and attempted to direct the child's attention to the type of information which was required (See Appendix C for the responses which

were used). The resulting referential messages were evaluated for content and also for the amount of egocentric and social speech which they contained. The results of that evaluation should indicate whether it is possible to elicit more information about each of the two types of figures (animal and abstract) than was provided in the initial referential message. If differences are found, it would lend support to the position that preschool and first grade children are capable of providing adequate information about referent materials. If no differences are found, it will be possible to determine whether the children were simply unable to perform the task or were restricted in their communicative performance by their level of egocentric development. Each of these possible explanations can be evaluated by examining the type of information produced by the speakers in each of the experimental conditions.

Thus far, the possible effects associated with different task materials and different types of listener responses on referential verbal communication performance have been considered. The implications for the present study of using preschool and first grade children have been discussed and the means by which the effect of these factors were determined have been described. Two further variables which may influence communicative performance are the level of vocabulary development and the ability to visually

discriminate or separate and recognize separate features. A mental age based on vocabulary level was obtained by Rubin (1973) and compared to referential communication performance. He found a significant relationship between the obtained vocabulary scores and the referential communication scores. This procedure will be followed in the present study in order to determine whether a similar relationship exists between the newly developed referent figures and vocabulary level.

The second dependant variable which was assessed was visual discrimination ability. Longhurst and Turnure (1971) hypothesized that perceptual discrimination may effect communicative effectiveness. In a test of this hypothesis, Susswein and Smith (1975) were unable to obtain support for this position. However, it is possible that their results may have been confounded by the reliance on verbal answers to their visual discrimination test. In the present study, a test designed by Birch and Lefford (1966) was used which can be answered entirely through non-verbal methods such as pointing or tracing. The child's visual discrimination ability is obtained by presenting pictures of various parts of whole, egocentric figures. The child is asked to point out the corresponding features on the complete figure displayed in front of them. This task is analygous to the Glucksberg et al (1966) referential

communication task since both tasks require the child to transmit information about a presented figure to a second person. Successful performance in each of the situations is dependant upon the speaker being aware of the salient features of each referent figure.

Chapter II

METHOD

Subjects

Forty-eight children (24 preschool and 24 first grade) were obtained from the Windsor school system and served as subjects. Each group of twenty-four children was composed of 12 boys and 12 girls. The preschool group was between 4 and 5 years of age and the first grade group was between 6 and 7 years of age (mean age difference = 2 years, 3 months).

Referent Stimulus Materials

Two pretest figures and 12 experimental referent figures were used in the study. The two pretest figures, while unfamiliar figures, contained a number of characteristics which were relatively easy to describe (See Appendix B).

The 12 experimental referent figures were composed of six abstract figures and six animal figures. The six abstract figures were randomly chosen from among ten figures constructed by Krauss and Weinheimer (1964). They were complex, abstract and had been deliberately constructed so that they were very difficult to describe (low encodable).

The six animal figures were composed of six animal parts obtained from six different animals. The animals were randomly chosen from among a set of fourteen used by Grushcow and Gauthier (1971). Three of the animals were

from their set of familiar animals (bear, camel and elephant) and three were from their set of unfamiliar animals (anteater, aardvark and armadillo). Each animal was then divided into six parts (head, tail, front legs, back legs, back and stomach). The six animal parts were divided so that they corresponded to six similar divisions of the abstract figures (left, middle and right top parts and left, middle and right bottom parts). One section from each of the six animals was then randomly combined to form one of the six experimental animal figures. The experimental figures were constructed so that only one part of each animal was used in each of the composite animals. The resulting figures were therefore composed of six different animal parts. They were complex (composed of many parts) and abstract (not real or concrete animals) but were more easily codable since they contained familiar animal features such as a head, tail, etc.

The fourteen figures consisting of the 2 pretest, 6 animal and 6 abstract figures (See Appendix B) were drawn in black ink on white, unlined, 13 x 18 cm cards. Each card was enclosed in clear plastic to protect it. This procedure is similar to that employed by Krauss and Rotter (1968).

Procedure

Each of the children took part in a single experimental session which consisted of the following tasks

being administered: the referential verbal communication task, the Peabody Picture Vocabulary Test (which provided an I. Q. level based on verbal ability) and a visual discrimination test developed by Birch and Lefford (1967) which provided a measure of part-whole visual discrimination). Each child was individually administered each task in a separate room supplied by each of the respective schools. Each evaluation was conducted by the main experimenter and was administered in the following order: Referential Communication task, Peabody Picture Vocabulary test and the Visual Analysis task.

Referential Verbal Communication Task

Each child was tested in a room containing a table, two chairs, a Sony TC 252 tape recorder, the experimental materials and a timer to record the amount of time used by each child to respond to each stimulus figure. The table was divided by a partition which contained an opening (11.5 x 16.5 cm) which was used to present the referential stimulus materials. A second round hole (2.5 cm in diameter) contained the microphone in order to record the child's responses. The round hole was covered with fine mesh to conceal the microphone and the tape recorder was also concealed from the child's view. Upon entering the room, the child was given the following instructions:

> We are going to play a game which is called Match-the-Pictures. You will see a picture through this hole and I want you to tell me

> what it looks like. I will try and pick out the one you are describing from these pictures. After you tell me about each one, I'll hold up the one I think it is and you tell me if I'm right, all right? Let's try two easy ones for practice.

If the child completed the two pretest trials, the following instruction was given:

> You did very well on those. We got them both right. Let's try the rest, all right? They are a little harder but if you try hard on them all, you will win a prize at the end. Are you ready? Remember, I have to pick out the right one, so try to tell me all about each one you see, O.K.?

If the child did not want to participate in the pretest trials, he (or she) was told that it was all right and was taken back to their classroom. If the child did participate in the experimental trials, the descriptions were tape recorded and the length of the response was timed. Upon completion of the task, the child was given a choice of several prizes, praised for being such a good player and returned to the classroom.

The experimental figures were presented in a predetermined, specified order which was counterbalanced within each group. Within each age group, 6 boys and 6 girls were presented with the stimuli in the following order (let A represent the animal figures and B, the abstract figures):

A B A A B B A B A A B B

The remaining 6 boys and 6 girls within each age group

received the following order:

B A B B A A B A B B A A

The sequence for each type of figure (animal and abstract) was randomly determined without replacement. The same sequence (order) within each type of figure was used for both presentation orders.

Each age group of 6 boys and 6 girls receiving one of the two presentation orders (either A, B, . . ., B or B, A, . . ., A) was further subdivided into two groups composed of 3 boys and 3 girls. One group received a general, nondirective feedback request of the following type:

> I'm not sure which one you mean. Could you tell me anything else about it?

(See Appendix C for the standard variations which were used within each feedback condition.) The second group received a more specific and directive feedback request such as the following:

> I'm not sure which one you mean. Can you tell me more about the sides or top of it?

Each feedback request was made only once for each of the twelve experimental figures. Five seconds were deducted from each child's description time to compensate for the time used to provide the feedback.

Therefore, within each age group of twenty-four children (12 boys and 12 girls), there were two subgroups, one for each type of presentation order. Each subgroup

consisted of 6 boys and 6 girls. Within each order, 3 boys and 3 girls were presented with a general nondirective request for more information and the other 3 boys and 3 girls were presented with a specific, directive request.

The twelve recorded descriptions obtained from each child were transcribed and scored according to the criteria presented in Appendix D. This provided a referential communication score for each child on each of the twelve figures and allowed three mean referential communication scores to be determined for each child; a total score, an animal score and an abstract score.

The (i) Peabody Picture Vocabulary Test and the (ii) Visual Analysis test were administered in the same room following the communication task. Each of the tests was administered and scored according to (i) the procedure outlined in the Peabody test manual and (ii) by the method described by Birch and Lefford (1967).

Statistical Analysis

The twelve referential descriptions obtained from each of the 48 children resulted in a total of 576 referential descriptions. A second rater scored eight of the 48 transcripts which were chosen at random in order to provide an interrater realiability estimate.

The mean referential communication scores formed the basis for a four factor analysis of variance based on the three between factors (grade level, type of feedback and

sex) and the one within factor (type of referent figure). Each of the main analyses were computed using The Statistical Analysis System (SAS) as described by Service (1972).

The estimates of vocabulary level obtained from the Peabody Picture Vocabulary Test and of visual discrimination were used as covariate scores in two separate analyses of covariance based on the SAS procedure.

Each of the 576 descriptions was scored for the number of meaningful words contained in the referential communications. This procedure was based on the technique described by Maclay and Newman (1960). It allowed a mean score to be obtained based on the number of meaningful words for both the animal and abstract referent figures as well as an overall mean score. Similar scores were obtained based on the amount of time used to respond to each figure including the referential description. Each of these dependent variables, meaningful words and amount of time, was used to calculate two additional four factor analyses of variance using the SAS procedure.

The statistical analyses outlined above will provide both a quantitative and qualitative examination of the referential communications obtained from each of the 48 children. In addition, the effect of vocabulary level and visual discrimination ability were examined using covariance procedures. These variables were also used to obtain correlation coefficients in relation to the referential communication scores.

Chapter III

RESULTS

The subjects in this study were divided into eight groups on the basis of grade level (preschool and grade one), sex (male and female), feedback (specific and general) and type of referent figure. Each child provided descriptions of six animal and six abstract figures presented in picture form. The twelve descriptions were recorded, transcribed and subsequently scored by the experimenter. The raw scores obtained by each child for the twelve figures are presented in Appendix E. The raw scores were then divided on the basis of the kind of figure being described, animal or abstract, and a mean referential communication score was calculated. The resulting two scores were used in the analysis that follows.

In order to obtain an estimate of interjudge scoring reliability, eight communication transcripts were randomly selected and scored by a second person.[1] This provided a sample of 96 descriptions out of a possible 576. The Pearson Product Moment Correlation between the two raters based on the sums of both the animal and abstract referential communication scores was .93 ($p < .01$).

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1. The author wishes to acknowledge with gratitude the assistance provide by Mary C. Tierney (now at the Department of Psychology, University of Saskatchewan, Regina, Saskatchewan).

The referential communication scores obtained by each child for each type of figure (animal and abstract) are presented in Appendix E. Using these scores, a four factor analysis of variance was computed based on the three between subject variables (grade level, sex and feedback) and the within subject variable (type of figure). The analysis (presented in Table 1) showed significant main effects for grade level, type of figure and type of feedback (See Figure 1). Neither the sex main effect nor any of the interactions were significant.

The analysis indicates that the referential communication scores of the grade one children were less egocentric than were those of the preschool children. Less egocentric and more meaningful communication scores were obtained, by both grade levels, on the animal figures as compared to the abstract figures. Finally, all of the children obtained higher communication scores in the specific feedback condition than they did in the general feedback condition independent of grade, sex or type of figure.

An additional purpose of the present study was to assess the effect of vocabulary level and visual discrimination on children's referential communication. Since it was not feasible to match the groups of children on these two variables, an analysis of covariance procedure was utilized. A vocabulary score (obtained from the Peabody Picture Vocabulary Test) and a visual discrimination score

Table 1

Analysis Of Variance Based On
Referential Communication Scores

SOURCE	SS	df	MS	F
Total	3402.969	95		
Between Subjects	2684.920	47		
G (Grade Level)	800.300	1	800.300	27.224**
F (Type of Feedback)	542.450	1	542.450	18.453**
S (Sex)	100.368	1	100.368	3.414
GF	37.700	1	37.700	1.282
GS	8.473	1	8.473	0.288
FS	5.106	1	5.106	0.174
GFS	14.648	1	14.648	0.498
Between Ss Error	1175.865	40		
Within Subjects	718.049	48		
P (Type of Picture)	494.225	1	494.225	107.560
GP	10.787	1	10.787	2.348
PF	11.016	1	11.016	2.398
PS	0.132	1	0.132	0.029
GPF	10.140	1	10.140	2.207
GPS	0.209	1	0.209	0.046
PFS	0.650	1	0.650	0.142
GPFS	7.096	1	7.096	1.544
Within Ss Error	183.794	40		

** = $p < .01$

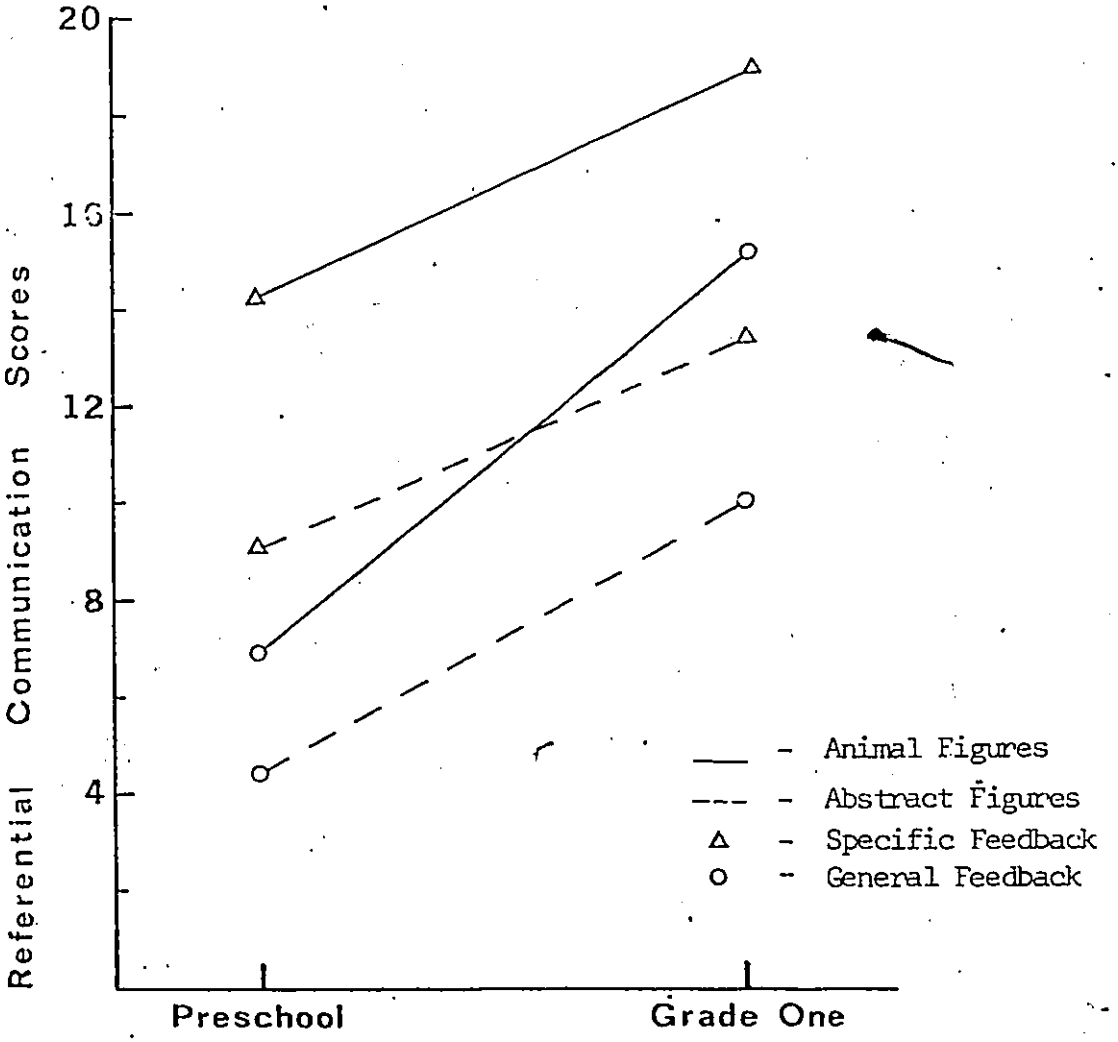


Figure 1. Overall Analysis of Variance for the Referential Communication Scores based on Grade Level, Referent Figures and Feedback

(obtained from a test designed by Birch and Lefford, 1967) were obtained for each child.

In order to determine the degree of relationship between the total referential communication scores obtained by each child and their respective vocabulary level and visual discrimination scores, two Pearson Product Moment Correlations were computed. The obtained correlation between the communication scores and the vocabulary level scores was .20 while the relationship between the communication scores and the visual discrimination scores was .60.

The estimate of each child's vocabulary level is presented in Appendix E. The vocabulary score for each child are presented in Table 2. The first analysis of covariance was computed based on the obtained mean scores (See Table 3). Significant main effects remained for grade level, kind of picture and kind of feedback despite the statistical control of vocabulary level. No interaction effects became significant. The only difference obtained was the emergence of a sex main effect.

These results demonstrate that with the effect of vocabulary level partialled out, less egocentric referential communication scores are obtained (i) by grade one children compared to preschool children (ii) on animal figures compared to abstract figures (iii) in specific feedback conditions compared to general feedback conditions and (iv) by females as compared to males. It should be

Table 2

Score Obtained By Each Child On The Peabody Picture Vocabulary Test (Vocabulary Level)

Preschool Children		Peabody Picture Vocabulary Score	Grade One Children		Peabody Picture Vocabulary Score
Specific Feedback			Specific Feedback		
- Males	1	97	- Males	1	115
	2	86		2	97
	3	117		3	115
	4	114		4	75
	5	91		5	112
	6	112		6	106
- Females	7	99	- Females	7	75
	8	112		8	97
	9	127		9	81
	10	98		10	99
	11	117		11	104
	12	127		12	85
General Feedback			General Feedback		
- Males	13	97	- Males	13	108
	14	113		14	87
	15	77		15	73
	16	112		16	93
	17	113		17	87
	18	119		18	87
- Females	19	76	- Females	19	100
	20	80		20	93
	21	67		21	89
	22	98		22	67
	23	104		23	110
	24	54		24	79

Table 3

Analysis of Covariance Based On Referential Communication Scores With The Effect Of Vocabulary Level Partialled Out (Cov A)[1]

SOURCE	SS	df	MS	
Total	3402.969	95		
Between Subjects	2684.920	47		
Cov. A (Vocab. Level)	108.639	1		
G (Grade Level)	977.045	1	977.045	35.554**
F (Type of Feedback)	344.318	1	344.318	12.530**
S (Sex)	154.378	1	154.378	5.618*
GF	20.661	1	20.661	0.752
GS	7.331	1	7.331	0.267
FS	0.036	1	0.036	0.001
GFS	0.761	1	0.761	0.028
Between Ss Error	1071.751	39		
Within Subjects	718.049	48		
Cov. A (Vocab. Level)	0.157	1		
P (Type of Picture)	494.225	1	494.225	107.560
GP	11.903	1	11.903	2.529
PF	9.744	1	9.744	2.070
PS	0.145	1	0.145	0.031
GPF	10.443	1	10.443	2.218
GPS	0.200	1	0.200	0.043
PFS	0.858	1	0.858	0.182
GPFS	6.791	1	6.791	1.443
Within Ss Error	183.583	39		

** = $p < .01$
* = $p < .05$

1. Due to limitations in the computer facilities, it was necessary to compute the between and within analyses separately which resulted in the two Covariate terms.

emphasized that the main effects are relatively independent of each other as is demonstrated by the lack of interaction effects. Thus, partialling out the effect of vocabulary level had relatively little effect on the results compared to the main analysis computed initially. The only significant change was in the main effect due to sex. These results are consistant with the obtained correlation calculated initially which indicated that vocabulary level would account for only four percent of the variance.

The visual discrimination score obtained by each child is presented in Appendix E. The means and standard deviations for each child are presented in Table 4. A second four factor analysis of covariance was computed using these scores (See Table 5). The main effects for type of picture and type of feedback remained significant with the partialling out of the effect of visual discrimination. However, the main effects of grade level and sex were nonsignificant in this analysis. These results are also consistant with the correlation discussed earlier. The correlation of .60 indicated that taking visual discrimination ability into account would account for 36 percent of the variance. What was not known by that result was that the variance was related to the differences in grade level.

The results, with the effect of visual discrimination

Table 4

Score Obtained By Each Child On The Visual Discrimination Test

Preschool Children		Visual Discrimination Score	Grade One Children		Visual Discrimination Score
Specific Feedback			Specific Feedback		
- Males	1	13	- Males	1	20
	2	6		2	18
	3	18		3	20
	4	17		4	20
	5	7		5	20
	6	12		6	18
- Females	7	20	- Females	7	15
	8	12		8	17
	9	16		9	20
	10	9		10	20
	11	19		11	20
	12	14		12	20
General Feedback			General Feedback		
- Males	13	13	- Males	13	20
	14	14		14	18
	15	5		15	20
	16	14		16	20
	17	17		17	20
	18	7		18	19
- Females	19	16	- Females	19	19
	20	16		20	20
	21	16		21	20
	22	10		22	18
	23	14		23	20
	24	4		24	19

Table 5

Analysis of Covariance Based on Referential Communication Scores With The Effect Of Visual Discrimination Partialled Out (Cov B)[2]

SOURCE	SS	df	MS	
Total	3402.969	95		
Between Subjects	2684.920	47		
Cov. B (Visual Disc.)	969.884	1		
G (Grade Level)	84.903	1	84.903	3.268
F (Type of Feedback)	489.959	1	489.959	18.857**
S (Sex)	71.212	1	71.212	2.741
GF	18.679	1	18.679	0.719
GS	27.633	1	27.633	1.064
FS	2.453	1	2.453	0.094
GFS	6.910	1	6.910	0.266
Between Ss Error	1013.287	39		
Within Subjects	718.049	48		
Cov. B (Visual Disc.)	5.376	1		
P (Type of Picture)	494.225	1	494.225	107.560**
GP	5.413	1	5.413	1.150
PF	11.058	1	11.058	2.350
PS	0.117	1	0.117	0.025
GPF	10.503	1	10.503	2.232
GPS	0.337	1	0.337	0.072
PFS	0.715	1	0.715	0.152
GPFS	6.782	1	6.782	1.441
Within Ss Error	183.523	39		

** = $p < .01$

2. Due to limitations in the computer facilities, it was necessary to compute the between and within analysis which resulted in the two covariate terms.

partialled out, demonstrate that referential communication scores are less egocentric when (i) they are based on animal pictures and (ii) specific feedback is provided by the listener.

The dependent measures in the present study were obtained from the verbal descriptions provided by each child. In order to determine whether the linguistic structure of the descriptions were influenced by the experimental manipulations, each description was scored for two kinds of linguistic features based on criteria established by Maclay and Newman (1960). Each description was first scored for the number of meaningful words which it contained. The obtained score was restricted to form words (nouns, verbs, adverbs and adjectives). The scores were then used to calculate a mean score for each of the two sets of figures, animal and abstract.

The mean scores for each subject (See Table 6) were then used as dependent measures in a four factor analysis of variance based on the three between subject variables (grade level, kind of feedback and sex) and the within subject variable (kind of figure). The results of this analysis (See Table 7) show significant main effects for grade level, type of figure and type of feedback (See Figure 2). The number of meaningful words produced was significantly greater (i) for grade one children (ii) for animal pictures and (iii) when specific feedback was

Table 6

Total Mean Scores and Standard Deviations Obtained By Each Child Based On The Number of Meaningful Words Used In Each Referential Description

	Preschool Children	
Group	Mean Number of Meaningful Words	Standard Deviation
Specific Feedback		
- Males	4.16	1.19
	11.17	4.15
	16.25	5.07
	16.25	5.43
	12.42	5.04
	13.08	4.32
- Females	34.42	9.74
	14.50	3.99
	16.50	3.40
	9.08	2.84
	16.58	7.39
	22.33	5.66
General Feedback		
- Males	8.50	4.23
	9.58	4.94
	7.83	4.75
	1.67	.89
	5.08	4.62
	7.58	2.78
- Females	6.50	1.62
	16.17	7.84
	10.17	6.04
	3.42	1.78
	11.08	3.34
	11.17	4.69

Table 6

Total Mean Scores and Standard Deviations Obtained By Each Child Based On The Number of Meaningful Words Used In Each Referential Description

Group	Grade One Children	
	Mean Number of Meaningful Words	Standard Deviation
Specific Feedback		
- Males	11.58	4.66
	16.83	3.88
	16.50	3.85
	13.67	6.57
	26.50	7.22
	23.83	6.37
- Females	18.08	4.03
	21.33	5.31
	25.17	6.07
	19.83	3.07
	22.08	4.38
	21.25	4.99
General Feedback		
- Males	27.83	8.66
	8.25	4.79
	22.25	5.80
	15.50	4.42
	23.58	7.24
	15.33	6.18
- Females	17.33	6.67
	25.17	5.92
	25.67	8.68
	12.33	6.11
	30.25	6.09
	8.92	2.97

Table 7

Analysis Of Variance Based On
Mean Number Of Meaningful Word Scores

SOURCE	SS	df	MS	
Total	5603.385	95		
Between Subjects	4103.135	47		
G (Grade Level)	1350.000	1	1350.000	19.064**
F (Type of Feedback)	327.673	1	327.673	4.627*
S (Sex)	270.010	1	270.010	3.813
GF	269.876	1	269.876	3.811
GS	35.819	1	35.819	0.506
FS	57.165	1	57.165	0.807
GFS	7.616	1	7.616	0.108
Between Ss Error	1784.976	40		
Within Subjects	1500.250	48		
P (Type of Picture)	220.948	1	220.948	43.996**
GP	0.421	1	0.421	0.084
PF	3.635	1	3.635	0.724
PS	2.667	1	2.667	0.531
GPF	2.898	1	2.898	0.577
GPS	0.000	1	0.000	0.000
PFS	1.938	1	1.938	0.386
GPFS	19.260	1	19.260	3.835
Within Ss Error	1248.483	40		

** = $p < .01$
* = $p < .01$

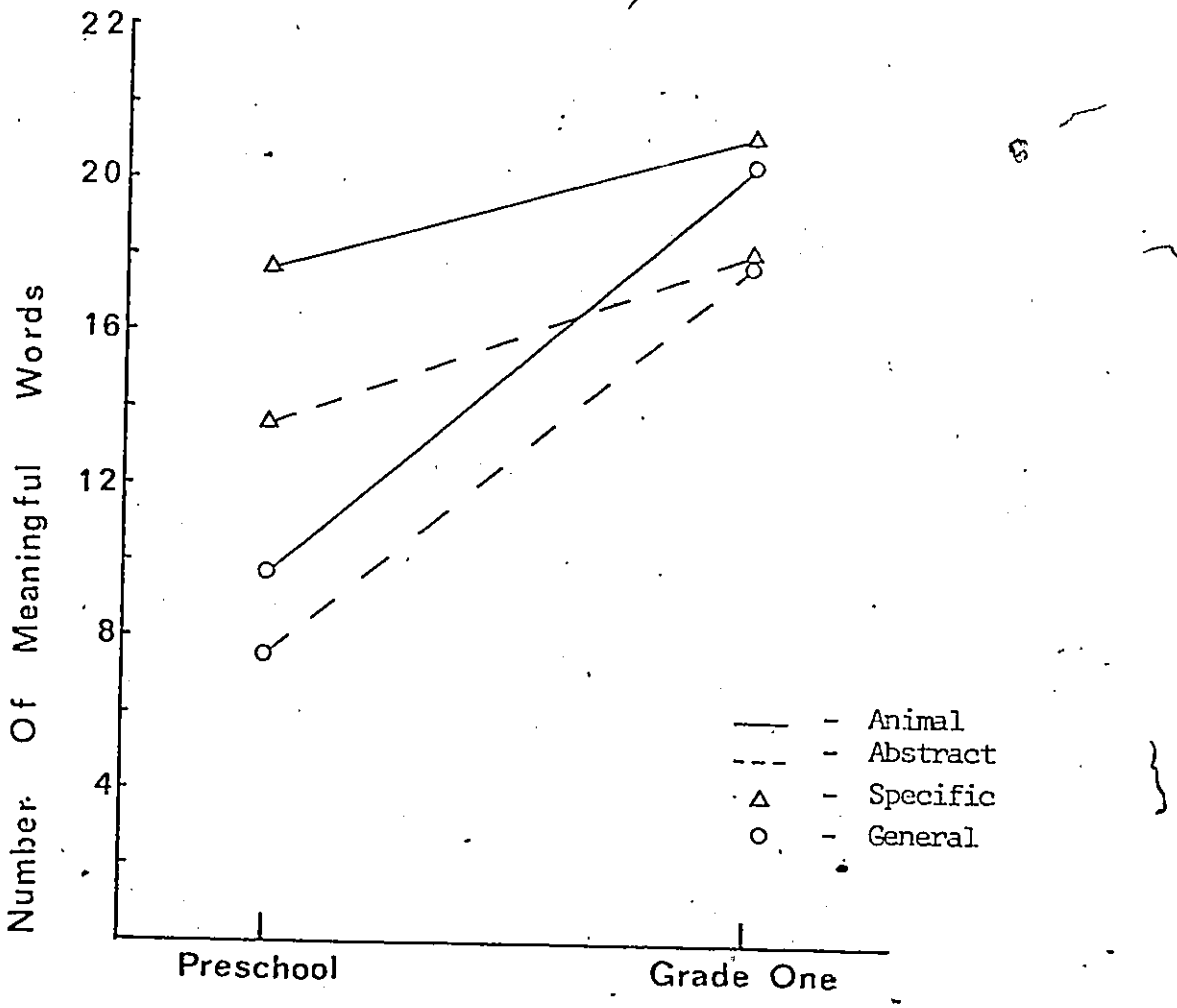


Figure 2. Effect of Grade Level, Referent Figures and Feedback on the Number of Meaningful Words Used in the Referential Descriptions.

provided. The main effect of sex and the interactions were not significant. Clearly, the number of meaningful words was affected by the experimental manipulations and therefore, cannot be considered to be completely independent of the referential communication scores.

The second linguistic variable which was considered was the amount of time used by each child to respond to each figure. This was obtained by timing the interval between the presentation of each figure and the end of the child's total verbal description. These scores were then used to compute a mean score for each of the animal and abstract sets of figures (See Figure 8) for each child.

The obtained scores were used to compute a second analysis of variance (See Table 9). Significant main effects were obtained for grade level, type of picture and type of feedback (See Figure 3). The sex main effect and the interactions were not significant. The results indicate that the amount of time used to provide the verbal descriptions was greater for grade one children as compared to the preschool children, for the animal figures as compared to the abstract figures and when specific feedback was provided instead of general feedback by the listener. Based on the obtained results, it appears that the amount of time used to verbally describe each picture is not entirely independent of referential communication since it too varies according to experimental manipulation.

Table 8

Total Mean Scores and Standard Deviations Obtained By Each Child Based On The Amount of Time Taken To Describe Each Referent Figure

Group	Preschool Children: Mean Amount Of Time (In Seconds)	Preschool Children: Standard Deviation
Specific Feedback		
- Males	27.08	11.49
	32.00	8.42
	26.75	9.10
	48.58	14.63
	25.42	10.12
	30.00	8.24
- Females	47.08	8.20
	32.17	9.53
	33.33	9.31
	24.18	5.87
	40.50	13.65
	29.00	8.00
General Feedback		
- Males	18.75	8.91
	27.17	16.51
	13.83	3.19
	19.17	9.18
	20.00	8.69
	19.50	12.49
- Females	17.25	9.33
	26.58	10.10
	19.75	9.95
	14.58	8.61
	16.00	5.83
	30.50	13.47

Table 8

Total Mean Scores and Standard Deviations Obtained By Each Child Based On The Amount of Time Taken To Describe Each Referent Figure

Group	Grade One Children: Mean Amount Of Time (In Seconds)	Grade One Children: Standard Deviation
Specific Feedback		
- Males	43.67	8.62
	45.33	7.45
	27.08	7.19
	37.17	18.34
	43.00	20.62
	34.33	11.11
- Females	48.42	13.73
	49.92	22.85
	54.08	17.04
	48.85	12.53
	46.92	11.86
	40.58	8.13
General Feedback		
- Males	24.25	7.91
	14.17	1.70
	27.17	7.60
	26.92	17.37
	31.63	15.75
	26.08	7.86
- Females	24.25	8.84
	35.67	12.22
	36.83	9.29
	22.42	7.89
	32.83	8.58
	19.92	9.44

Table 9

Analysis Of Variance Based On Mean Amount Of Time Taken To Describe Each Referent Picture

SOURCE	SS	df	
Total	13926.558	95	
Between Subjects	10197.862	47	
G (Grade Level)	1859.352	1	1859.352
F (Type of Feedback)	4919.350	1	4919.350
S (Sex)	383.320	1	383.320
GF	58.360	1	58.360
GS	105.903	1	105.903
FS	129.526	1	129.526
GFS	51.788	1	51.788
Between Ss Error	2690.263		
Within Subjects	3728.696	48	
P (Type of Picture)	1336.459	1	1336.459
GP	0.876	1	0.876
PF	39.002	1	39.002
PS	7.510	1	7.510
GPF	48.351	1	48.351
GPS	33.571	1	33.571
PFS	87.230	1	87.230
GPFS	52.762	1	52.762
Within Ss Error	2122.935	40	

** = $p < .01$

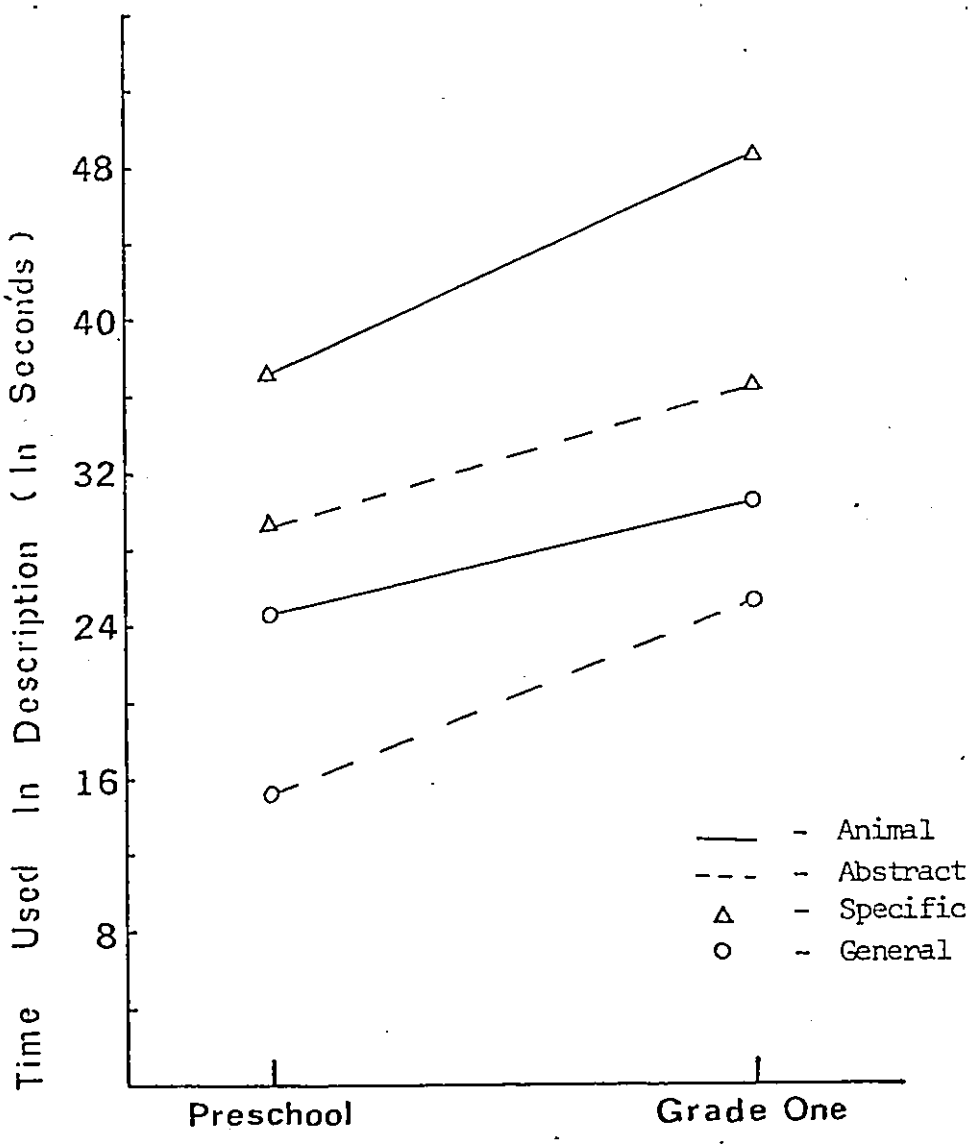


Figure 3. Effect of Grade Level, Referent Figures and Feedback on the Amount of Time Used to Provide the Referential Descriptions.

Chapter IV

DISCUSSION

The purpose of the present study was to examine the referential communication performance of preschool and first grade children. Several characteristics of the referential task were manipulated (e.g. type of referent, feedback and sex) in order to measure their possible effects on communication performance.

In a review of referential communication literature, Krauss and Glucksberg (1970) concluded that children younger than six years of age were generally unable to successfully perform a referential task (e.g. provide meaningful descriptions of referent materials). The results obtained in recent investigations, however (Borke, 1971, 1972; Gruschcow and Gauthier, 1971; Maratsos, 1973), have raised the question of whether referential task performance is influenced by the kind of task which is being used. Since each of these investigations depended upon a task which differed in some way from the original paradigm outlined by Glucksberg, Krauss and Weisberg (1966), there is some difficulty in generalizing from each of their results to those originally reported by Krauss et al (1970).

In the present investigation, the original paradigm used by Krauss et al (1966) was retained in order to provide a more comparative basis for the results obtained within each of the experimental manipulations. Therefore,

any differences which were found could be ascribed with more confidence to the independent variables since the experimental paradigm was being held constant. In this way, referential communication performance could be measured in relation to age as defined by grade level, the degree of abstractness of the referent materials, the specificity of the feedback provided by the listener and the sex of the child providing the referential communication. Such a design also allowed comparisons to be made more readily between the obtained results and those reported by Krauss et al (1969; 1970), especially in relation to the communication performance of preschool children. In addition, the results were compared to those obtained from investigations which changed the referential task design in order to determine whether their results may have been due to the differences in their referential tasks compared to that described by Glucksberg et al (1966) and the present study.

Two further variables which were statistically controlled were vocabulary level and visual discrimination. Since any referential communication appears to depend upon the ability to discriminate the distinguishing features of the referent and then providing a verbal description of those features, an estimate of each variable was obtained in order to evaluate their effect on referential communication performance.

The results clearly support the hypothesis advanced by Longhurst and Turnure (1971) that visual discrimination ability significantly affects referential communication performance. When the communication scores obtained by the preschool and grade one children (mean age difference = 2 yrs. 3 mos.) were statistically equated in relation to their obtained visual discrimination scores, the effect of age as defined by grade level became nonsignificant. This indicates that the improvement in referential communication performance which is found as children become older (Krauss et al, 1970; Glucksberg, Krauss and Higgins, 1975) may be due, in part, to an increase in the number of perceived salient features of the referent materials.

Contrary to previous results (Rubin, 1973), vocabulary level as measured by the Peabody Picture Vocabulary Test did not significantly effect referential communication performance. When communicative performance scores were statistically adjusted in relation to the obtained vocabulary level scores, there was no significant change in the results. On the basis of these results, it would appear that meaningful referential communication does not depend on an extensive vocabulary and that the vocabulary of a preschool child is generally adequate to construct a meaningful referential message.

The general hypothesis that characteristics inherent to the referential task would significantly effect

referential communication performance was consistantly confirmed. As expected, the referential communication scores obtained by the grade one children were less egocentric in each conditions than were those obtained by the preschool children. More important, however, were the consistant effects obtained within each of the two groups of children as defined by grade level which will be discussed.

The obtained results demonstrate that the referential communication performance of both the preschool and the grade one children is affected by the characteristics of the referential task being used. Therefore, it appears possible that the differences found in the referential communication literature may be due, in part, to differences between the referential tasks which were used. The results of the present study demonstrate two characteristics of the referent task which should be considered when comparing referential tasks. First, the referent materials which are used should be compared in relation to their levels of abstract complexity. Referential communication performance varies inversely with the abstract complexity of the referent materials. Therefore, care should be taken to ensure that the obtained results reflect only performance in terms of the task demands and do not reflect an artificial ceiling effect related to the referent materials.

A second significant influence on referential communication performance is the type of feedback given to the

speaker. In the present study, communication performance improved (e.g. contained more meaningful referential information) in conditions in which the feedback provided by the listener became more specific and meaningful. Both the preschool and grade one children were able to improve their subsequent communicative performance, based on the Glucksberg et al (1966) criteria, as compared to their initial communicated descriptions. Also, they were able to improve on both types of referent materials, animal and abstract. Therefore, it would appear that they were capable of providing more information than was given in the initial referential response. Less improvement in performance was found in the nonspecific, nondirectional feedback conditions. Therefore, care must be exercised when comparing the results of different studies in order to take into consideration possible differences due to feedback. It can be seen that the type of feedback provided by Maratsos (1973) and others differs markedly from that used by Glucksberg and Krauss (1967). Such differences must be considered since the level of referential communicative performance in the present study increased as the amount of specific information contained in the feedback was increased.

While communication performance varied in relation to the type of referent and the type of feedback being used, it should be noted that the results, in part, support the conclusions of Krauss et al (1969; 1970) and Glucksberg

et al (1975). The preschool children consistantly obtained lower performance scores than did the grade one children. Therefore, there is little doubt that referential communication performance is, in part, a function of the level of intellectual development (Ginsberg and Opper, 1969; Flavell, 1965; Elkind, 1974). However, it is also important to realize that referential communication is not determined completely by intellectual development and that performance can be influenced by independent variables which can be brought under experimental control.

The analysis of the qualitative features of the obtained referential descriptions provides further support in relation to the effect of task characteristics on referential communication. Each referential description was scored for both the number of meaningful words used to describe each referent figure and the amount of time used to provide the complete description. The results clearly indicate that each of the two qualitative variables was significantly affected by the experimental conditions. Significant differences were consistant both within and between the preschool and grade one groups of children. More meaningful words were produced and more time was used to produce the referential description when the animal referents were used in the specific feedback conditions. The grade one children produced more words and used more time than did the preschool children. These results,

while not central to the purpose of the study, attest to the influence of the referential task on communicative performance.

While the results obtained in the present study have been considered in relation to their immediate implications for children's referential communication performance, it is also possible to interpret them in terms of the rather extensive literature related to referential communication performance. In an extensive review of referential communication studies, Glucksberg et al (1975) summarized the evidence prior to and including that which was published in 1973. Included within their summary was the conclusion that little is known about the development of the component processes which lead to adequate communicative performance. On the basis of the present results, it seems probable that the ability to visually discriminate the component parts of a referent stimulus may be one important component in the development of adequate referential communication skills. Whether or not visual discrimination ability may be an integral part of the more generalized concept of decentration associated with egocentrism (Piaget, 1926; Looft, 1972; Elkind, 1974) cannot be answered on the basis of these results. However, on an intuitive basis, there would seem to be some basis for such a connection. In the present discussion, however, visual discrimination will be considered only as an apparent necessary component in

referential communication. Since its statistical control leads to the elimination of a previously significant age effect, it appears that it is worthy of further experimental investigation.

While Glucksberg et al (1975) justifiably advocate caution in the interpretation of any single set of results, the following conclusions seem reasonable in relation to both the obtained results and the available literature. Preschool children are capable of producing adequate referential communication but are more restricted by task related characteristics than are grade one or older children. This does not mean that their communicative performance is equal to that of older children. Rather, it implies that preschool children possess the basic competance in terms of the necessary skills to produce a referential message. However, their performance or ability to construct such a message is related to such task specific variables as the characteristics of the referent stimuli being used and the type of feedback which they receive.

When viewed from a production deficiency position, the apparent contradictions existing in the literature become more reasonable. Such differences, in the light of the present results, can be largely attributed to changes in the task demands when compared to the original Glucksberg et al (1967) referential communication task.

As the results of the present study demonstrate, even minor changes in the experimental task can result in significant changes in referential communication performance.

Finally, it would appear from the results that the animal referent materials constructed for use in the present study may present a viable alternative for studying the referential communication of preschool children within the Glucksberg et al (1966) paradigm. Not only were the results consistant between each group of children, but there was also a clear differentiation based on communicative performance between the two types of referent materials within each group based on grade level. Finally, the range of scores related to performance on the animal referents provides support for their differentiating ability between individuals within each of the age groups based on grade level. Therefore, it would appear that the new referential materials developed for use in this study allow an estimate to be obtained of varying levels of referential communication or communicative egocentrism in preschool aged children.

APPENDIX A

REVIEW OF THE LITERATURE

Verbal communication can be used in a variety of ways such as expressing emotion, controlling behaviour (Vygotsky, 1962) and exchanging information. Various types of information can be exchanged in many different situations such as in a lecture given by one person to a large audience, a group discussion and a discussion between two people. When information about a specified topic is provided by one person for another person, it is referred to as referential communication since the information exchanged is about or in reference to a particular subject. The present study dealt with the ability of young children to provide adequate referential information in a particular task situation. Several factors will be considered which may influence children's performance on referential verbal communication tasks.

The review of the literature will examine previous results in order to provide greater information about (i) the types of tasks which have been used to assess referential communication (ii) the conclusions which have been made about the performance of both adults and children on such tasks (iii) the factors which have been examined in relation to referential performance and (iv) the implication of the results to date for the present study.

Referential communication tasks typically consist of,

a person who constructs and transmits a verbal message (the speaker) to a second person (the listener) who receives, processes and acts upon the information contained in the message to perform a specific task. A set of referent materials such as colour samples, a particular set of words or a set of pictures of specific figures are provided for the speaker and are presented one at a time. The listener is usually asked to choose the referent stimulus to which the speaker is referring from among a set of alternative referent stimuli which include the proper referent. Children below the age of six years do not appear capable of providing referential messages which allow the listener to make an accurate choice (Glucksberg, Krauss and Weisberg, 1966; Glucksberg and Krauss, 1967; Krauss and Glucksberg, 1969; 1970). One possible explanation for the failure of preschool children to successfully provide meaningful referential information is based on the concept of egocentrism described by Piaget (1926; 1951; 1969).

Egocentrism essentially refers to the inability of children between the ages of three and six (Selman, 1972) to comprehend or realize that perspectives other than their own do exist and must be taken into consideration in certain situations (Looft, 1972). In referential communication tasks, preschool children do not seem to be aware that the listener does not have the information related

to the particular referent stimulus avialable to him despite the fact that the participants are typically separated by a barrier and have been pretrained on the referential task. Preschool speakers typically employ a large amount of egocentric speech which refers to speech which has meaning only to the person who produces it (e.g. It looks like my mommy's hat). Since the listener has no way of understanding knowing about the particular reference being used (e.g. mommy's hat), the information is meaningless to him. The argument has been made (Glucksberg et al, 1966; Krauss et al, 1970) that children below the age of six produce egocentric referential messages because they are not aware that the listener has a different perspective or frame of reference from that of the speaker. As children become older, they base their referential messages on more commonly understood information or associations which results in what is known as social speech (Piaget, 1926). The results of the majority of the research to date appears to support such an interpretation (Krauss et al, 1970) since preschool children do produce egocentric referential messages and are unable to perform most referential tasks accurately.

Despite the generally consistant performance results obtained from children on referential tasks, there may be certain factors which could have influenced the type of results which have been reported. For example, the most

popular task developed by Glucksberg et al (1966) does not differentiate between levels of referential communication ability below the age of approximately six years. Therefore, the task being used may not be appropriate for use with preschool aged children since it is known that egocentrism declines somewhat between the ages of three and six (Flavell et al, 1968; Selman, 1972; Ilkind, 1974) and yet this decline cannot be detected in the majority of referential communication studies. In addition, results will be discussed in the review which suggest that the type of referent materials being used do influence performance levels as do certain types of responses which are provided by the listener after the speaker's initial message. It therefore appears that external factors may influence referential performance and may, in part, help to account for the failure of children below the age of six years, on a certain type of referential communication task.

Basic Referential Communication Paradigms

Referential communication paradigms can vary in various ways such as the method of communicating the information from the speaker or source to the listener or destination (either verbally or non-verbally), emphasizing different aspects of the communication sequence (the function of the speaker or source or of the listener or destination or both)

and using different types of referential materials (such as figures, colours, etc.) to mention only a few. Despite this variation, certain aspects of the basic referential paradigm must be present in order for particular variation to be considered a referential communication task design. The three basic requirements are a speaker or source, a listener or destination and a referent or group of referents of some type. The task always depends upon the communication of information by the speaker about the particular referent stimulus being used. The listener receives the message and attempts to perform some task on the basis of the information contained in the message. The adequacy of the message is typically judged by whether the listener can perform the task correctly, such as choosing the referent being described from among a set of alternatives which are available (Krauss and Weinheimer, 1964).

Since the present study examined the verbal transfer of information, only the literature relevant to referential verbal communication will be considered. In such research, subjects of various age levels can be combined in pairs to perform the referential communication task. In order to ensure that only verbal communication is used during the task, the subject pairs are separated by various methods: separate rooms, separate tables or opaque screens. Such methods are effective in maintaining control over the content of the communication which evolves, restricting

the topic of communication to the referent and controlling the direction of the communication, e.g. speaker to listener, listener response to speaker or interactions between the speaker and listener. Since the present study dealt with the development of referential verbal communication, the standard Stack-The-Blocks Paradigm used with children is described in detail.

Stack-The-Blocks Paradigm

The basic paradigm was adopted from the work of Maclay and Newman (1960) while the materials were developed by Krauss et al (1964). The children are seated at a table, one on each side and are separated by an opaque screen. The speaker must try to describe a particular referent figure so that it can be correctly chosen by the listener from six possible alternatives. The figures used are complex, abstract and have low codability ratings on the scale developed by Brown and Lenneberg (1954). The referent figures are presented in a "Stack-The-Blocks" game format. Each figure is printed on four sides of a wooden block which is dispensed one at a time to the speaker. After describing the figure, the block is stacked on a wooden cylinder. The listener attempts to stack the blocks which are displayed in front of him in the same order as those of the speaker, using the description provided by the speaker. The children are usually pretested and taught how to play the game using animal figures in the same

paradigm. A posttest is conducted using these figures to ensure that performance was not due to the children forgetting how to play the game. Different variables can be manipulated within this framework and the obtained referential descriptions may be analyzed for linguistic features.

The "Stack-The-Blocks" paradigm was developed by Glucksberg, Krauss and Weisberg (1966) who felt it could be adopted to study four main aspects of referential communication: (i) the verbal message generated by the speaker, (ii) the discriminative response made by the listener, (iii) various types of verbal feedback and (iv) modifications of the original description by the speaker. It has been widely used for these purposes and most referential research involving children has been based on this paradigm or a slightly modified version usually involving the way the referents are presented to the speaker.

Topic Outline for Review of the Literature

The review of the referential verbal communication literature will be divided into sections based on the type of referential materials which were used in each study. This will be done since it provides a natural distinction between those studies which were usually based on adult subjects and the studies which used children as subjects. The first three sections deal with predominantly adult research and employ the following types of referent

materials:

(i) a set of word pairs, one of which serves as the referent. The speaker must identify the correct word for the listener by providing a single associated word clue of his choice (Rosenberg and Cohen, 1964).

(ii) a set of 24 colour chips based on the Numsell colour system which was developed by Brown and Lenneberg (1954).

(iii) a set of highly abstract, complex figures which are difficult to encode (Krauss and Weinheimer, 1964).

The fourth section contains the review of literature which used children as subjects. Since the research with children has been primarily based on the Krauss et al (1964) figures, it follows naturally from the preceding section. A brief summary and discussion of the relevance of the results for the present study will be provided at the end of each section.

Two other sections have been included in the review of the literature. One section deals with the effect on the speaker's communication when various types of responses are provided by the listener. The second section deals with research in which procedural changes have been introduced into the task which have led to results which do not coincide with previously reported results. A brief discussion of the implications of the results will also

be provided at the end of each of these sections.

Verbal Referents

The first two studies in this group used adults to investigate how referent words and descriptions were chosen by the speaker in a task situation. In the first study by Rosenberg and Cohen (1964), it was found that more low probability word association referents (unique references) were chosen than high probability word association referents (common references). They concluded that the latter type were rejected due to their more ambiguous and general associations. In a later study (Rosenberg and Cohen, 1966), it was argued that both the speaker and the listener engage in sampling behaviour before making a final decision. They argued that the speaker samples various reference words and compares them with the actual referent word before verbalizing the final choice. The listener also makes several comparisons between the reference word and the possible alternatives before making a decision. They also reported that the type of experimental instructions provided can affect the type and amount of sampling comparisons which are made, although no empirical data was presented for this statement.

Cohen and Klein (1968) used the same task with children from grades 3, 5 and 7. Each child was required to give a single word clue to the listener. The authors reported that the listener's choice accuracy increased with the

grade level and that the differences obtained could be enlarged by using more difficult words. The main difference was that the content of the words used as clues was similar in form across each grade but differed between grades. Two types of words were designated for each grade; popular words which were used often and lower frequency words which were used less often. It was found that the oldest group was more accurate than the youngest group, especially when basing a decision on the lower frequency words. Also, the popular seventh grade words resulted in more accurate choices for both groups than did the popular third grade choices. Three possible explanations were offered to explain this finding: (i) the younger children did not compare associations before emitting words, (ii) the younger children did not consider the listeners needs, (iii) the third grade performance was due to relative deficiencies in their associative repetoires. The latter could limit both the number of potential word clues available to them and also their judgement of relative associative strengths between the clue and referent words. On the basis of their results, they concluded that the third explanation was most likely since the associative word strengths seemed sufficient at the third grade for recognition when they were supplied. However, their associative strength was not strong enough for them to be sampled during the task. As further evidence for this,

the authors cite Palermo (1963) who reported that culturally shared associations develop with age and McCarthy (1954) who found that vocabulary size continues to grow with age.

The results discussed above emphasize the importance of the listener's knowledge of the associative or referential connotations of words. Success on the verbal referent task appeared to be directly related to how well the listener could generate a number of possible associations for the word provided by the speaker and compare them to the two possible word choices. It was also emphasized that since the ability to generate word associations increases with age, that referential tasks should be used which are appropriate to the age level of the subjects being used. In the present study, a second set of simplified referential materials will be used in order to determine if the performance of preschool children in previous studies was influenced by the difficulty of the referential materials which were used.

Colour Chip Referents

The following studies, based on colour chip referents and using adults, attempted to clarify the effects of several variables on referential verbal communication. The first study by Krauss and Weinheimer (1967) dealt with the effect of similar, as opposed to dissimilar, referent sets on the encoding or description produced by the speaker.

They also varied the amount of response (based on total words) which the speaker received from the listener by using both a monologue and a dialogue situation. The dependent variables were the length of the reference phrase and the amount of interpersonal agreement (correct choices) which was attained in each condition. They reported that while names were longer for the similar referent sets, there was more variability of length in the dialogue as opposed to the monologue condition. Despite these results, the mode of communication (monologue vs. dialogue) did not have a significant effect. Interpersonal agreement was greater for (i) the dissimilar referent sets and (ii) in the dialogue mode. They concluded that as the referents became more similar, the popular names were rejected and unusual referents were chosen which were longer but differentiated between the referents more clearly. (Based on the results of Rosenberg and Cohen (1964) discussed above.)

The difference between social and nonsocial descriptions was investigated by Krauss, Vivekananthan and Weinheimer (1968). They asked 52 female undergraduates to describe half of the referent colours for themselves (nonsocial) and half for use by other people. Two weeks later, each female was asked to choose the correct colours using four types of descriptions: (i) their own social or nonsocial descriptions and (ii) other females social and

nonsocial descriptions. The results showed no difference between either of their own descriptions, both of which resulted in the best performance, but much better performance with other's social descriptions than with other's nonsocial descriptions. Surprisingly, there was no difference in the length of the descriptions between the social and nonsocial conditions although the nonsocial descriptions were more diverse and contained more unusual and unique words than did the social descriptions. The colours also differed in how easily they could be described which affected accuracy under the other's nonsocial description condition. Unusual and unique words were negatively related to accuracy in the social decoding conditions but positively related to accuracy in nonsocial conditions. Generally, the content or lexical features of the descriptions was more related to accuracy than was the length of the description.

The results discussed in this section emphasize how factors associated with the referential task can influence communicative performance. The level of performance was affected by an interaction between the type of referents used and the response produced by the listener. Dissimilar referents required more interpersonal communication in order to increase the number of agreements. Both studies report that more unique and unusual references were used with the similar referent sets. It was argued that this

was done to differentiate the particular referent from other, highly similar referents. Finally, it was reported that descriptions produced for the use of other people were more effective when given to a different listener than were descriptions produced for use of the speaker alone. Each of these factors is externally related directly to the referential task and can significantly influence the type of communication produced but none of the factors are intrinsically necessary for a basic referential verbal communication paradigm. Therefore, the attempt in the present study to focus on external factors which could influence the communicative performance of young children appears to have some basis in the existing literature.

Abstract Figure Referents

Krauss and Weinheimer (1964) developed a complex set of abstract figures in order to determine changes in referent phrases over a number of trials. They used five pairs of undergraduates who each participated in 16 trials. The speaker's task was to describe each card on which six figures were printed so that the listener could identify the correct card from six possible alternatives. In each trial, three of the figures had the same position while the other three were interchanged. They measured the number of words used in each trial to describe each of the six figures and reported that the phrases used to describe the most frequently mentioned figures were shorter than

those used for the less popular figures. Also, the reference phrases became shorter over several repetitions. In all of the trials, the abstract figures were described in relation to familiar objects. They concluded that with increased usage, the undergraduate pairs were able to converge on a shared description which did not require elaboration.

Using the same design, Krauss and Weinheimer (1966) included two types of feedback conditions to evaluate the effect each had on the reference phrases. 48 female subjects were used to evaluate the two types of feedback response provided by the listener. Confirmatory feedback indicating that the listener had acted on the speaker's message was used 50% of the time for half of the females and 100% of the time for the other half. Concurrent feedback which occurred during the speaker's message was used for half of the females and was not used for the other half. The results indicated that reference phrases were shortened due to (i) concurrent feedback, (ii) 100% confirmation and (iii) repetition. Although repetition interacted significantly with each of the other main effects, there was no interaction between all three. While all three variables affected the reference phrases separately, it was concluded that concurrent feedback had more effect on the speaker's message than either type of confirmatory feedback.

A third study conducted by Krauss and Rotter (1968) attempted to clarify the role of status in referential communication. They found evidence in the literature of differences in language between middle and lower status children related to vocabulary, sentence construction and other areas. They used 30 seven year old and 30 twelve year old children, one half of each age group being middle status white children and the other half being lower status black children. Twelve names were obtained for each of the four groups (age x status) which described the six abstract referent figures by asking five extra children who met the criteria for each group to name the figures. The experimental groups were pretrained in the task using circus animal figures. They were then read the obtained reference names and asked to choose the correct abstract figures. It was found that the names given by the middle status children were used more effectively by all groups than those given by the lower status children. The middle status groups were more accurate as both speaker and listener although no differences in intelligence scores were found. The effect of status was found to be less for the older groups than for the younger groups although both age and status affected speaking proficiency. The authors concluded that the lower status groups seemed deficit in communicative ability which may have been due to less home communication, poorer language forms and their more

restricted environment.

The above results demonstrate that as adults participate in a referential task, they develop a concise set of associative or referential messages which are used to convey information about the more stable aspects of the referential material. It also appears that responses which help the speaker evaluate his communication are helpful when they are provided in conjunction with the actual referential messages. (This result will be considered in more detail in the section specifically considering the effect of listener responses.) Finally, the ability to produce and comprehend an adequate referential message appears to be related to status which was based on socio-economic, education, and other factors. While these results do not directly relate to the present study, they do clarify extraneous factors which influence referential verbal communicative performance.

Abstract Figure Referents; Stack-The-Blocks Paradigm

The paradigm was developed by Glucksberg, Krauss and Weisberg (1966) to investigate the types of descriptions which could be made in two groups of children. The youngest group was 33-49 months old (about 3-4 years) and the older group was 52-63 months of age (about 4 1/2-5 years). They found that the younger children were unable to complete even the preliminary pretesting of the task. The older group, although able to perform accurately on the pretest,

were not successful using the abstract figures. The children attempted to assign names to the figures instead of describing the attributes of each one. In order to determine if a 'set' had been created by the pretest materials to use names, blocks were substituted which had to be described by the names of two colours. Once again, the children were successful on this task but unable to perform well using the abstract figures. They again described the objects in terms of objects which, while being familiar to them, had no meaning for the listener (egocentric descriptions).

A second group of children (46-63 mos.) were then read descriptions of the abstract figures provided by adults. It was found that 8 out of a possible 12 children were able to perform successfully and that 7 of these 8 could also perform accurately as the descriptions were progressively shortened.

In a final variation, the experimenter read the descriptions provided by each child speaker (47-59 mos.) back to that particular child to determine if the descriptions had meaning for them. Despite the apparently ideosyncratic references, each child was able to choose the correct referent figure on the basis of his or her own description.

The conclusions based on these results were that (i) both adults and children refer to the figures in

relation to nameable objects, not by describing the attributes of the figures, (ii) the children were unable to develop a shared nomenclature for the figures, as did adults, (iii) the preschool children were able to choose correctly using adult references but were unable to generate such references themselves, (iv) the references used by each preschool child had meaning for the child who provided them.

Glucksberg and Krauss (1967) then examined the effect on the speaker's communication of three types of responses provided by the listener. They were particularly interested in whether children developed more social types of communication under such conditions. They differentiated between nonsocial and social communication as follows: (i) nonsocial communication if found in young children and is similar to free word association. They felt that there was no evaluation of the informative value of such descriptions before it was given and that there would be no change under feedback conditions, (ii) social communication was seen as being edited and its value established before being communicated. In such a case, the speaker would be aware of his goal, the context of the task, the available alternatives and the perspective of the listener. Therefore, social speech was capable of being influenced by responses from the listener.

Three response conditions, ranging from very general

requests to somewhat more direct requests, were used with five groups of 36 children each. The groups were composed of kindergarten, first, third, fifth and college students. They found that the three response conditions had similar effects. The younger groups displayed limited repetoires and were not able to modify their descriptions in appropriate ways (by giving new or more complete descriptions). Modifications which were useful increased with age in a manner similar to that of accurate performance. The only two groups to use pointing and tracing were the kindergarten and first grade children. Linguistic analyses of the descriptions illustrated that one or more forms of social editing developed as the age levels increased. It was pointed out, however, that editing is also affected by other cognitive processes which were as yet undetermined.

The relationship between age and communicative skill as a function of reduced errors was further investigated by Krauss and Glucksberg (1969). They used 74 pairs of children drawn from kindergarten and the first, third and fifth grades. They reported that a decrease in errors over eight trials was related to an increase in age. In fact, the effects due to age, number of trials and the interaction were all significant while no effect was found to be related to intelligence level (as measured by the Stanford-Binet). They concluded that better performance

might be due to a composite of several skills. They then assessed the adequacy of messages composed by speakers of different ages independent of the listener's ability to understand them. 15 of the messages given by the children in the earlier trials were given to 90 undergraduate students to determine if they could match them to the correct figures. They found that the descriptions given by different age groups resulted in similar types of scores (which increased with the age of the group from which the description was obtained). Linguistic analyses demonstrated that there was no difference in the number of different words used or in the mean rank of vocabulary between groups. Also, no difference was found between the use of common words, lexical construction, frequency of correct choices or in the levels of intelligence.

These results were discussed in relation to McNeill's (1966) communicative and linguistic competance concepts. The former refers to an individual's ability to use language while the latter is related to more basic language skills, such as vocabulary. It was concluded that young listeners do not have the linguistic competance of adults, despite their more advanced communicative competance. Therefore, the competance of the listener must be taken into account when using accuracy scores as an indicator of speaker competance.

The research based on the "Stack-The-Blocks" paradigm

has been summarized by Krauss and Glucksberg (1970). In it, the authors reaffirm their belief that young children are unable to perform a referential communicative task successfully. They again relate their work to Piaget's (1926) concept of egocentrism. This concept would seem to explain the lack of successful performance as being due to the speaker's conviction that the listener understands from the beginning and even knows in advance what will be said to him. Therefore, the speaker fails to include the precise information needed to ensure successful performance. They feel that this is compounded by the young child's belief that the name is an integral part of the object and is therefore invariant and not subject to change. Therefore, by invoking the proper name, all of the necessary characteristics of the particular object are included. Such a belief is called nominalism and like egocentrism, is widely used by Piagetians to explain early childhood communicative behaviour.

Since the present study was designed, in part, to investigate questions raised by this particular section of literature, the following discussion of the results will include several criticisms and also attempt to show how they might be resolved. One possible criticism of the stack-the-blocks paradigm is that the figures used may not be appropriate for use with preschool and primary school children.

Several studies have been considered (Rosenberg et al, 1964; 1966; Cohen and Klein, 1968) which have emphasized that referential tasks should be constructed so as to be appropriate for use with certain age groups. If this is not done, the results may well be confounded by external variables which make it difficult to draw conclusions. It seems possible that the Krauss et al (1964) figures may be influencing the referential communication of preschool children which is resulting in an inflated amount of egocentric speech. However, this may be due to an inability to produce more social references because of a limited vocabulary or associative concepts and not because of their egocentric level of development. Similarly the results may be due completely to their level of egocentrism but we cannot be sure at this time. The simplified set of referential figures to be used in the present study attempts to provide more information on this question. It is hoped that the figures will allow several levels of referential communicative performance to be determined which can then be examined for characteristic differences and other linguistic attributes. This would enable a more precise description to be made of how children develop referential communication skills.

A second possible criticism of the stack-the-blocks paradigm is the instructions which are given to the participants in the task. The speaker is told to tell the

listener what to do rather than to describe the referent figure to the listener. Adults are able to recognize what is required and perform successfully. Preschool children may also be able to provide the necessary information but may not realize what is required. If either reason is correct, it would increase the probability that egocentrism is responsible. The important aspect of the question is that we do not know whether either or both reasons are valid. By asking preschool children to describe the referents and then examining their responses, we may be able to determine more clearly how egocentrism acts to restrict referential communication in young children.

A third potential problem may have been the type of listener responses which were used, Glucksberg et al (1967). Since these will be discussed in considerable detail later, they will not be considered at this time.

Effects of Listener Response on Referential Communication

Several types of response and their effects have been mentioned in various studies previously discussed. These will be considered briefly before two main developmental studies concerned with the effects of different types of listener response are discussed in detail.

Krauss and Weinheimer (1966) found that concurrent and 100% confirmatory responses enhanced the speaker's construction of a referential message. They also found

(1967) that the amount of directional information in the response provided by the listener increased referential performance. The increased amount of interaction increased the amount of information which was provided by the speaker about the referent colour. Glucksberg and Krauss (1967) were not able to detect significant positive changes using three types of responses and concluded that the ability to use feedback increased with age. On the basis of these results, the effect of the listener's response on the speaker's communication seems to require additional clarification. Two studies, in particular, have been conducted which found that specific types of responses affected children's communication at early ages.

Fishbein and Osborne (1971) examined the effect of three types of responses on the task developed by Glucksberg et al (1966). They obtained children from the first and fifth grades. The types of responses used were: (i) delayed corrective, in which they showed the results of each trial to the participants and made corrections if it was necessary, (ii) serial noncorrective, in which the participants were told how well they did after each block of 6 trials and (iii) terminal noncorrective, in which the participants were told their score at the end of each block of 6 trials but were not corrected. They found that the age of the participants had a significant effect and that the older children showed a greater increase in successful

performance. They also found that delayed corrective and serial noncorrective response resulted in increased performance to a greater extent than did terminal noncorrective.

Children of the same age were then tested in corrective or noncorrective response conditions on paired associate and nonpaired associate tasks using fifth grade children as speakers. The results indicated that the Glucksberg et al (1966) task was very similar to a paired associate learning task. The corrective response condition resulted in better performance than did the noncorrective condition. They concluded that both the type of response provided by the listener and the age of the speaker had an important effect on task performance. These effects were important for both the listener who must decode the speaker's message and for the speaker who must decode the listener's response since it affects encoding ability.

The ability of children to recognize the listener's need for more information has been investigated by Peterson, Danner and Flavell (1972). They first ensured that each group of four and seven year old children could describe each referent in several ways and that an adequate speech repetoire was available. They used three types of listener response: (i) facial expressions indicating noncomprehension, (ii) an implicit request indicating a lack of understanding and (iii) an explicit request for more

specific kinds of information. The results showed that the facial condition had little effect on either group of children while the explicit response resulted in improved performance for the seven year olds but not for the four year olds. They concluded that the older group was more aware of what the situation required than was the younger group. It also indicated that the younger subjects were capable of giving more information when they were specifically asked for it. It seems possible that more specific instructions about task requirements may lead to improved performance.

The results discussed above indicate several characteristics of listener responses which seem to result in the speaker providing more meaningful information and a resulting increase in referential communication performance. These characteristics are: (i) concurrancy which refers to the response being given immediately following the speaker's communication, (ii) if a response is given after each communication is received, (iii) when there is specific information contained in the response which directs the speaker to the type of information required, (iv) when information in the response is stated rather than simply alluded to by the listener.

Since each of these characteristics appears to enhance performance, it is possible that they might also result in an improvement in the referential messages of preschool

children on the stack-the-blocks type of paradigm. In the present study, both general, nonspecific and non-directional responses and more specific, directional responses will be provided to the speaker following each communicated message. The former type will not contain information about what is required while the latter will provide a constant, limited amount of such direction to the children.

The results which have been discussed may also explain why Glucksberg et al (1967) did not find any increase in meaningful content resulting from the responses which they had the listener provide. While one of the three responses was relatively more direct compared to the others and contained more words, it did not contain any information which would indicate to the speaker what was required. The responses varied only on how directly the listener requested additional information. While this is sufficient to result in an adult providing more meaningful information, it does not appear to alter the performance of preschool and early primary school aged children. They appear to require more direct, immediate information which can be used to guide them to more meaningful information. The present study will attempt to assess whether such responses do lead to improved performance.

Referential Studies Based on Alternative Paradigms

The studies reviewed to date have all been based on

a similar type of experimental paradigm and have investigated a variety of situations and variables related to referential communicative ability. One consistant result found in this literature is that young children under approximately six years of age are not able to perform successfully on referential tasks. While many variables have been modified and examined, no one has systematically varied the referential materials to determine how this would affect preschool children's performance. The two studies to be considered do include variations and the results illustrate that the effect of the referent used can be quite significant.

Grushcow and Gauthier (1971) developed four types of referential materials based on familiar and unfamiliar animal pictures and familiar and unfamiliar abstract symbols. They used 51 to 62 month old children (4-5 years) who were pretested and taught to perform the role of the listener using coloured blocks. The children were also taught to make decisions based on descriptions of the referents instead of using object names to describe the referents. They found that the children were able to perform better on the animal figures than on the abstract figures and also were more successful with the familiar referents than with the unfamiliar referents. They concluded that young children were able to apply information provided in the form of descriptions better than in the

form of object names. In addition, they found that the level of performance based on young children is a function of the degree of the abstractness of the referent rather than of its familiarity. This suggests that the results obtained using the abstract figures developed by Krauss et al (1964) may have been influenced more by the referents which were used than by the requirements of the task itself.

A second study conducted by Maratsos (1973) lends support to this conclusion. The task which he used is described as a very simple referential communication task. The children, aged 3, 4 and 5, were asked to describe to the experimenter which toy they wanted to use within the context of a game. The toys were grouped in three sets based on how difficult it was to describe a particular toy within each set. The easiest group consisted of different species arrays, the next of different colour arrays and the most difficult, of different position arrays. A second factor which was varied was whether the experimenter could see the sets of toys or whether he appeared to be blind (without sight). The results clearly indicated that more complete and explicit descriptions were given across all levels of situational difficulty in the blind conditions as opposed to sight conditions. This indicates that the children were aware of the differences in the listener's needs and adjusted their descriptions to meet this need. This could also be taken as an indication that

these subjects were nonegocentric since they appeared to be aware of the listener's impaired perspective and adjusted their descriptions accordingly. Their limited skill in adjusting to the listener's perspective was apparent because they did not appear to realize that a verbal description was not appropriate in the blind conditions. However, this may have been influenced by the task instructions they received from the experimenter.

Significant effects were also found between the three levels of descriptive difficulty within each of the sight and nonsight conditions. Within the sight condition, this effect was obtained between the simplest and the two more difficult levels of descriptive difficulty. This was interpreted as being due to the children realizing that complete descriptions were not required due to the listener being able to see each set of toys. Within the blind condition, the difference was obtained between the most difficult descriptive condition and the two easier conditions. This seemed to be due to the difficulty of the hardest set since the children (even the 3 year olds) still tried to provide adequate information but were not able to succeed. However, their performance appeared to be restricted more by their linguistic (vocabulary, number of referents, etc.) rather than their communicative competance.

It is also interesting that pointing was used

frequently in the vision condition but occurred only twice out of 144 trials in the blind condition. Contrary to the existing literature, no age effect was found although this may have been due to the simplicity of the task (Maratsos, 1973). Even the youngest children modified their speech in the blind conditions to compensate for the apparent deficiency of the listener. The overall conclusion was that preschool children were able to perform successfully in a referential task situation but that their performance was affected by the difficulty of the task.

Menig-Peterson (1975) conducted a similar study involving the modification of communicative behaviour in preschool children in relation to the listener's perspective. Both three and four year old children engaged in a variety of activities with an adult. One week later, each child described what had occurred during that period to (i) the adult involved in the activity or (ii) a naive adult. She found that both age groups modified their descriptions according to the amount of knowledge available to the listener.

These results have several implications for future research into referential verbal communication (including the present study). Since Grushcow et al (1971) found that listener performance in preschool children was affected by abstractness of the referents which were used,

it is probable that abstractness also affects the performance of the speaker. In fact, it has been reported that preschool children can choose the correct referent given adequate information (Krauss et al, 1970) even though they cannot produce the information verbally. Therefore, the abstractness of the referent may affect the production of an adequate message in preschool children to a greater extent than it affects their performance in the role of the listener. Since the figures developed by Krauss et al (1964) are extremely abstract and complex, there is a possibility that the egocentric messages found in preschool children using these figures was influenced, in part, by the abstract qualities of the referent figures. In the present study, this possibility will be evaluated by comparing aspects of the referential communication provided in each experimental group for the animal referent figures and the abstract figures used in previous studies (developed by Krauss et al (1964).

The study reported by Maratsos (1973) once again raises the question of why preschool children were unable to perform one type of referential communication task (Glucksberg et al, 1966; Krauss et al, 1969; 1970) but were successful on a second type of task (Maratsos, 1973) supposedly requiring the same ability. The discussions preceeding this section have dealt with various possible reasons which will not be repeated here. One result of

this study (Maratsos, 1973) was of particular interest since it indicated that not only were preschool children capable of producing social messages but were also able to modify their messages to correspond with the perceived limitations of the listener (with or without sight) which they should not have been capable of doing if they were egocentric. Since the argument that such children are unable to perform referential communication tasks due to their egocentric development has been used to explain previous task failure (Glucksberg et al, 1966; Flavell et al, 1968; Krauss et al, 1969; 1970), there appears to be a contradiction in terms of what preschool children are capable of performing. The present study will attempt to determine if other factors may be responsible for producing the contradictory results, such as the type of referents used in the task and others discussed earlier.

Conclusion

On the basis of the literature which has been discussed, it appears that further information is required in order to clarify the issues which have been raised in this review. Therefore, the present study attempted the following:

(i) to develop a more age appropriate task based on simplified referent materials in order to discriminate between children who are more restricted in their referential verbal communication by their level of egocentrism from children who are capable

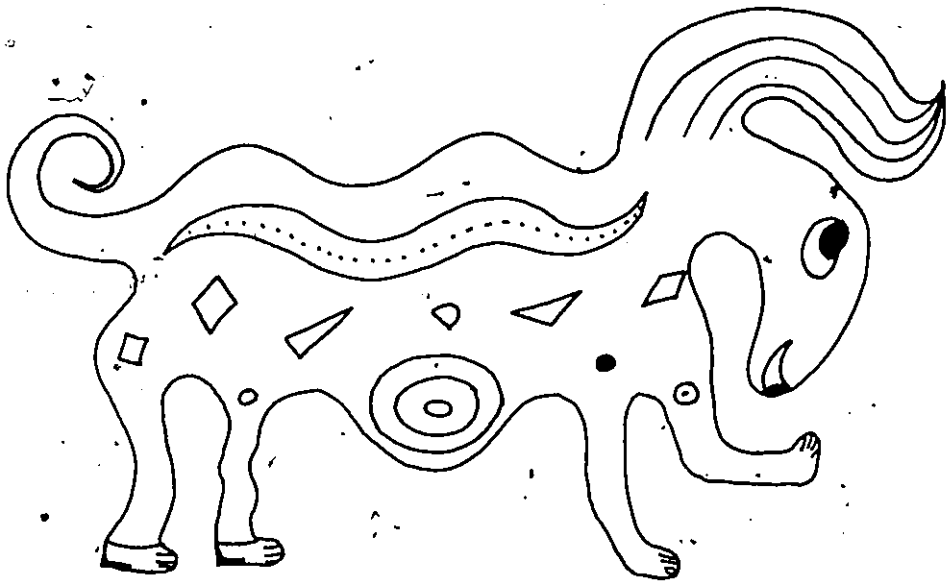
of producing more social forms of referential communication.

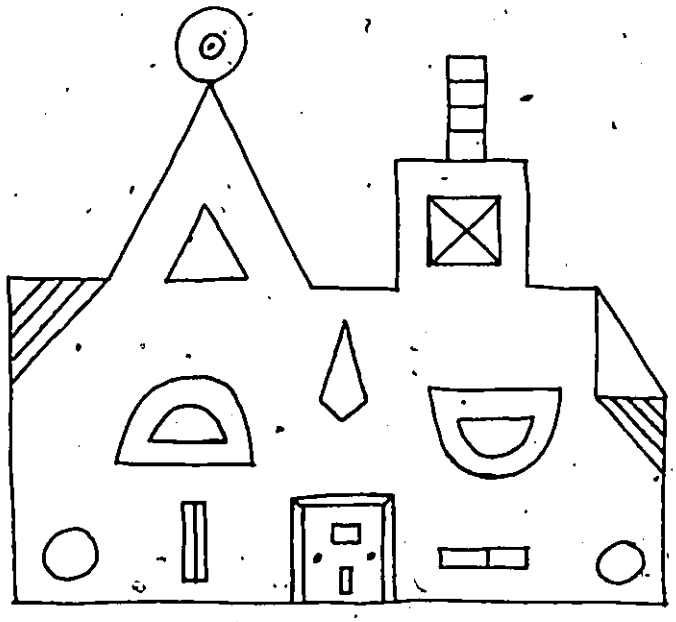
(ii) to assess other aspects of the referential task which have not previously been examined, such as the effects of different referential materials and listener responses in order to clarify whether they influence the production of egocentric responses in children.

(iii) to test the hypothesis that preschool children were capable of producing social and adequate descriptions about referent materials and that this was directly related to the type of referent material used in the task.

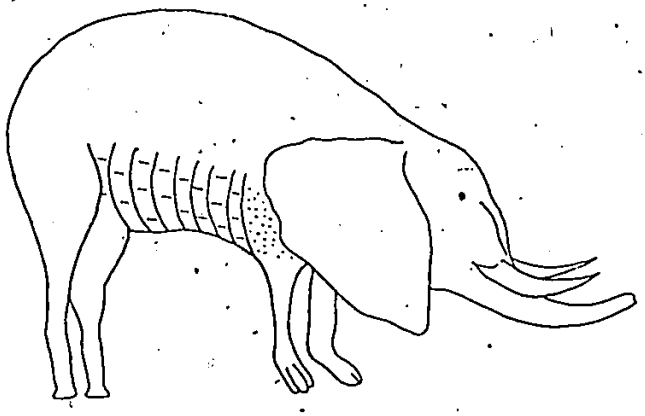
APPENDIX E - Referential Figures

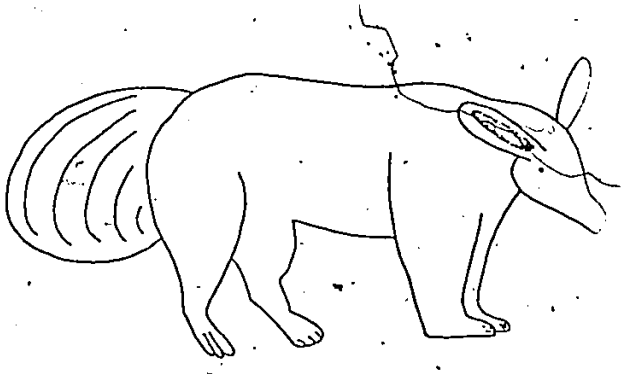
(i) Pretest Figures

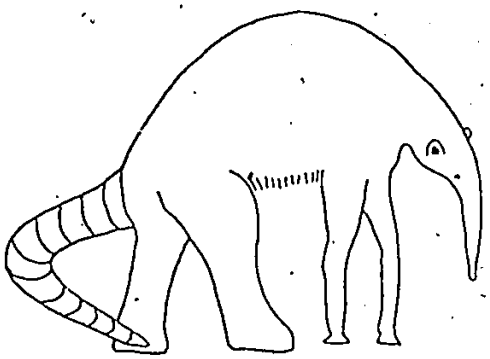


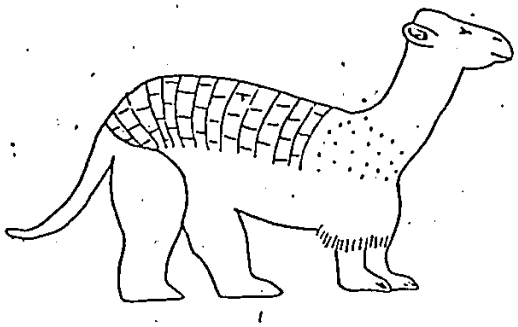


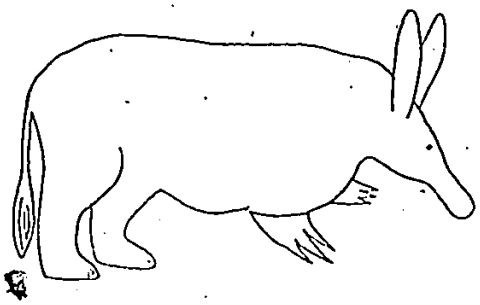
(ii) Animal Referent Figures

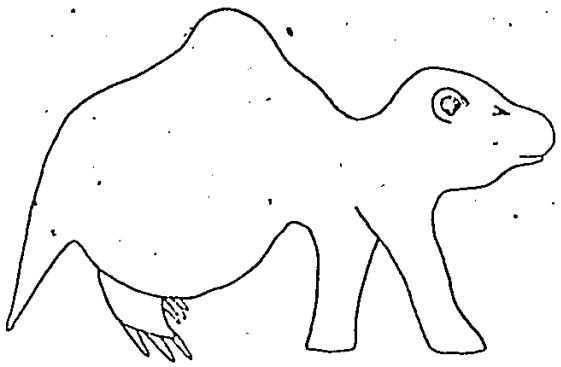




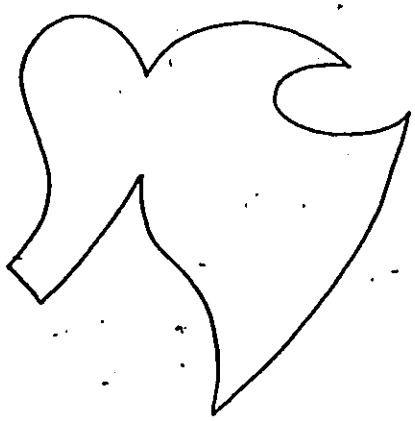


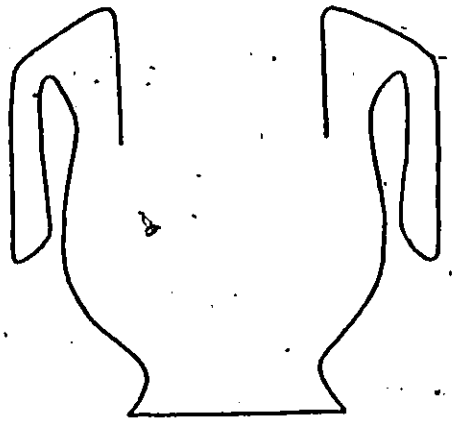


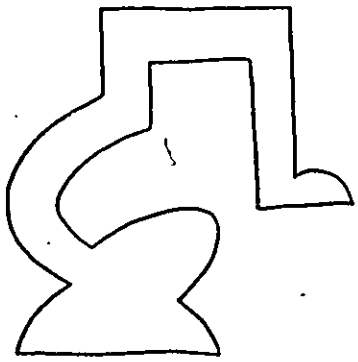


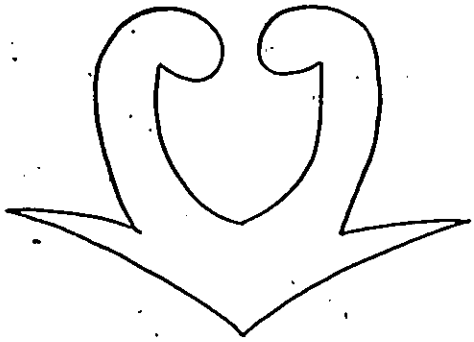


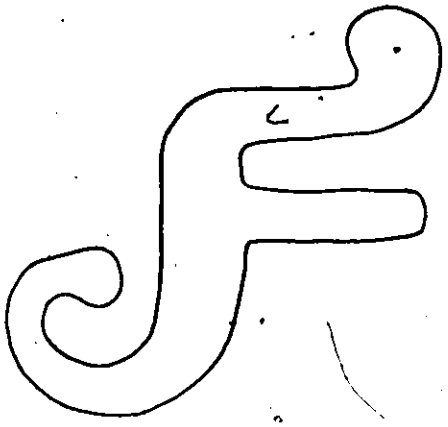
(iii) Abstract Referent Figures

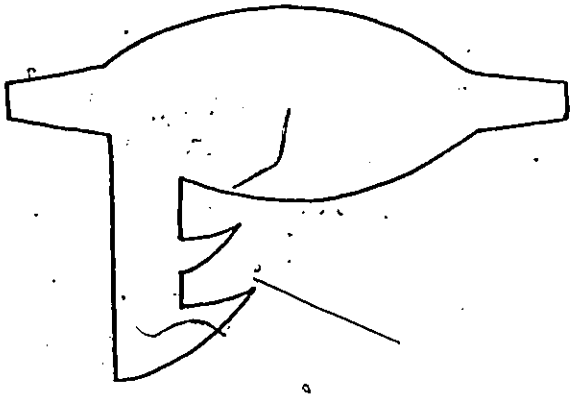












APPENDIX C

The feedback responses provided by the listener (the experimenter) in response to each child's initial referential verbal communication are presented below. Each feedback response was used twice within the twelve experimental trials (based on the twelve experimental figures). The presentation order was randomly predetermined without replacement with the stipulation that the same feedback response could not be given twice in a row. This was done to reduce the chance of the child becoming bored or frustrated during the task situation.

(A) Feedback responses used during the general non-directive condition:

(i) I'm not sure which one you mean. Could you tell me anything else about it?

(ii) I don't think I know yet. What else can you tell me?

(iii) I'm not sure of the right one yet. Is there anything else you can tell me?

(iv) I don't know which one it could be. Would you tell me more about it?

(v) I can't choose the right one yet. Isn't there more you can tell me?

(vi) I don't understand which one it is. Can you describe more of it to me?

(b) Feedback responses used during the more specific, directive condition:

(a) with the abstract figures.

(i) I'm not sure which one you mean. Could you tell me more about the sides or top of it?

(ii) I don't think I know yet. What can you tell me about the bottom or the center of it?

(iii) I can't choose the right one yet. Can you tell me about the edges or the corners of it?

(b) with the animal figures.

(i) I'm not sure of the right one yet. Is there anything you can tell me about its front or legs?

(ii) I don't know which one it could be. Would you tell me about its body or its tail?

(iii) I don't understand which one it is. Can you describe its back or its head to me?

The same order was used in providing feedback to each child depending upon the condition. The feedback was provided by the listener in a normal voice without excessive emphasis on any particular part of the response.

After the child responded to the feedback, the listener held up the correct figure so that the child could confirm the choice. This was done to reinforce the child's response and maintain the atmosphere of a game. After the child confirmed the choice, it was placed in a box on one side of the table.

If the child did not respond to the feedback, the listener waited for ten seconds and then placed the card

in a box on the other side of the table. They then proceeded to the next figure.

APPENDIX D

Eight of the transcribed referential description transcripts were scored by an independant judge as well as the main experimenter. An interjudge correlation coefficient was computed to determine the level of agreement between the two sets of scores. Each referent feature which was included in the description was scored based on the following criteria:

(i) an Egocentric description (1 point): a description which is based on information that the listener could not normally be expected to know. e.g. It looks like my mommy's hat.

(ii) a Social description (2 points): a description that is based on information of which the listener could be expected to have some knowledge or could apply to the set of alternative figures to determine the figure in question. e.g. It looks something like a shirt, or It has a long nose.

If only one general referential description was given, it was scored by the same criteria. A final subscore for the 12 figures was computed based on the initial descriptions (before feedback) by adding the appropriate scores.

The referential descriptions elicited by the feedback conditions were evaluated by the above criteria as well as by criteria developed by Glucksberg and Krauss (1967).

Each elicited referent feature was scored by the additional following criteria:

0 points :- silence

1 point :- repetition of first response or simple rewording.

2 points :- modification of the first response such as elaboration, clarification or other meaningful change related to the same referent features which were initially used.

3 points :- a new referent description; describes a new feature of the referent figure.

These scores were added to the scores assigned by the first criteria to obtain a total feedback score for the twelve referent figures.

A total referential verbal communication score was obtained by adding the scores obtained on the initial and feedback sections of each description for all twelve figures. A low score indicated high egocentrism and poor referential verbal communication performance while a high score indicated low egocentrism and good performance. The scores were analysed to provide further information where applicable about the referential performance within each group. An example of the scoring sheet which was used is presented on the following page.

SAMPLE SCORING SHEET

Subject #: ____ Figure #: ____ Condition: ____ Age: __yrs. __mo.

REFERENTIAL SCORES

(a) Initial Response

Referential Features Described:

Egocentric (1)
Social (2)

Subtotal =

(b) Elicited Response

Referential Features Described:

Egocentric (1)
Social (2)

Subtotal =

(c) Type of Elicited Response For Each Feature:

(i) Social (0)

(ii) Simple Repetition or Rewording (1)

(iii) Modification (2)

(iv) New Description (3)

Subtotal =

Total Referential Communication Score =

LINGUISTIC FEATURES SCORES

(a) Total Number of Meaningful Words

(b) Amount of Time Used to Describe Figure (In Seconds)

NON-REFERENTIAL SCORES

(a) Peabody Picture Vocabulary Score =

(b) WISC Blocks Design Score =

APPENDIX E: Raw Data

Primary Score Data Table - Preschool Children

Group		Mean Communication Score - Animal Referents	Mean Communication Score - Abstract Referents	Mean Total Communication Score - Animal and Abstract Referents
Specific Feedback				
- Males	1	5.84	5.00	5.42
	2	13.34	8.34	10.84
	3	17.34	10.84	14.09
	4	16.00	7.34	11.67
	5	10.00	6.50	8.25
	6	16.00	7.17	11.59
- Females	7	22.00	18.00	20.00
	8	12.67	7.84	10.26
	9	14.34	8.50	11.42
	10	7.84	3.67	5.76
	11	16.67	13.50	15.09
	12	19.00	12.00	15.50
General Feedback				
- Males	13	3.50	3.00	3.25
	14	3.84	5.00	4.42
	15	5.84	3.50	4.67
	16	4.84	4.00	4.42
	17	14.67	7.00	10.84
	18	7.00	4.34	5.67
- Females	19	2.50	1.84	2.17
	20	14.81	8.34	11.58
	21	7.17	4.84	6.01
	22	4.34	3.67	4.01
	23	5.34	4.67	5.01
	24	9.17	2.34	5.76

Primary Score Data Table - Grade One Children

Group		Mean Communication Score - Animal Referents	Mean Communication Score - Abstract Referents	Mean Total Communication Score - Animal and Abstract Referents
Specific Feedback				
- Males	25	21.50	13.67	17.59
	26	13.84	11.00	12.42
	27	13.67	10.33	12.00
	28	18.84	13.34	16.09
	29	19.00	13.84	16.42
	30	17.34	13.84	15.59
- Females	31	22.84	11.17	17.01
	32	23.67	14.67	19.17
	33	19.67	11.84	15.76
	34	21.50	23.50	22.50
	35	18.00	13.34	15.67
	36	15.67	12.17	13.92
General Feedback				
- Males	37	17.84	10.17	14.01
	38	4.84	3.84	4.34
	39	18.00	10.50	14.25
	40	13.84	8.17	11.01
	41	16.83	10.83	13.83
	42	14.00	5.50	9.75
- Females	43	17.17	10.50	13.84
	44	21.50	14.00	17.75
	45	17.34	17.50	17.42
	46	9.50	6.84	8.17
	47	25.34	18.34	21.84
	48	7.00	4.84	5.92

Mean And Standard Deviations Of All Variables Based On The Abstract Pictures

By Age, Type Of Feedback And Sex (n = 6/group)

	Preschool Children, Specific Feedback, Males		Preschool Children, Specific Feedback, Females		Preschool Children, General Feedback, Males		Preschool Children, General Feedback, Females	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Communication Score	7.532	1.962	10.585	5.003	4.473	1.416	4.283	2.326
Vocabulary Score	102.833	13.167	113.333	12.879	105.167	15.626	79.833	18.767
Visual Discrimination	12.167	4.957	15.000	4.195	11.667	4.633	12.667	4.844
Meaningful Words	9.860	3.770	17.223	7.696	6.140	2.518	8.193	3.398
Amount of Time	27.417	7.329	31.222	7.338	14.945	3.706	16.915	5.311

Mean And Standard Deviations Of All Variables Based On The Animal Pictures

By Age, Type Of Feedback And Sex (n = 6/group)

	Preschool Children, Specific Feedback, Males		Preschool Children, Specific Feedback, Females		Preschool Children, General Feedback, Males		Preschool Children General Feedback, Females	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Communication Score	13.087	4.408	15.420	4.977	6.615	4.152	7.222	4.371
Vocabulary Score	102.833	13.167	113.333	12.879	105.167	15.626	79.833	18.766
Visual Discrimination	12.167	4.957	15.000	4.195	11.667	4.633	12.667	4.844
Meaningful Words	14.582	5.452	20.583	9.822	8.418	3.689	11.303	5.534
Amount of Time	35.862	10.548	37.557	9.313	24.527	8.053	24.640	7.736

Mean And Standard Deviations Of All Variables Based On The Abstract Pictures

By Age, Type Of Feedback And Sex (n =6/group)

	Grade One Children, Specific Feedback, Males		Grade One Children, Specific Feedback, Females		Grade One Children, General Feedback, Males		Grade One Children, General Feedback, Females	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Communication Score	12.670	1.578	14.448	4.603	8.168	2.911	12.003	5.560
Vocabulary Score	103.333	15.475	90.167	11.462	89.167	11.356	89.667	15.227
Visual Discrimination	19.333	1.038	18.667	2.160	19.500	0.837	19.333	0.817
Meaningful Words	17.305	6.059	19.307	1.769	16.805	6.139	19.333	8.350
Amount of Time	35.527	8.230	41.140	5.388	23.722	6.208	27.555	6.136

Mean And Standard Deviations Of All Variables Based On The Animal Pictures

By Age, Type Of Feedback And Sex (n = 6/group)

	Grade One Children, Specific Feedback, Males		Grade One Children, Specific Feedback, Females		Grade One Children General Feedback, Males		Grade One Children, General Feedback, Females	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Communication Score	17.365	3.099	20.225	3.044	14.225	4.947	16.308	6.976
Vocabulary Score	103.333	15.475	90.167	11.462	89.167	11.356	89.667	15.227
Visual Discrimination	19.333	1.033	18.667	2.160	19.500	0.837	19.333	0.817
Meaningful Words	19.000	5.898	23.223	3.338	20.777	8.211	20.553	9.182
Amount of Time	41.335	9.430	55.500	8.530	28.972	8.537	29.748	9.106

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Larry William Waterman was born on April 10, 1947 in Lacombe, Alberta. He attended elementary school in Lindsay, Ontario and high school in both Lindsay and Toronto, Ontario. He was married on June 17, 1972 in Waterloo, Ontario to Dianne L. Stevens. In October, 1973, he graduated from the University of Waterloo with a Bachelor of Arts Degree. In September, 1973, he began his graduate work at the University of Windsor.